GET THE BEST: 89 MACINTOSH UTILITIES REVIEWED AND RATED

NOVEMBER 1991

MacUser

32 HARD DRIVES

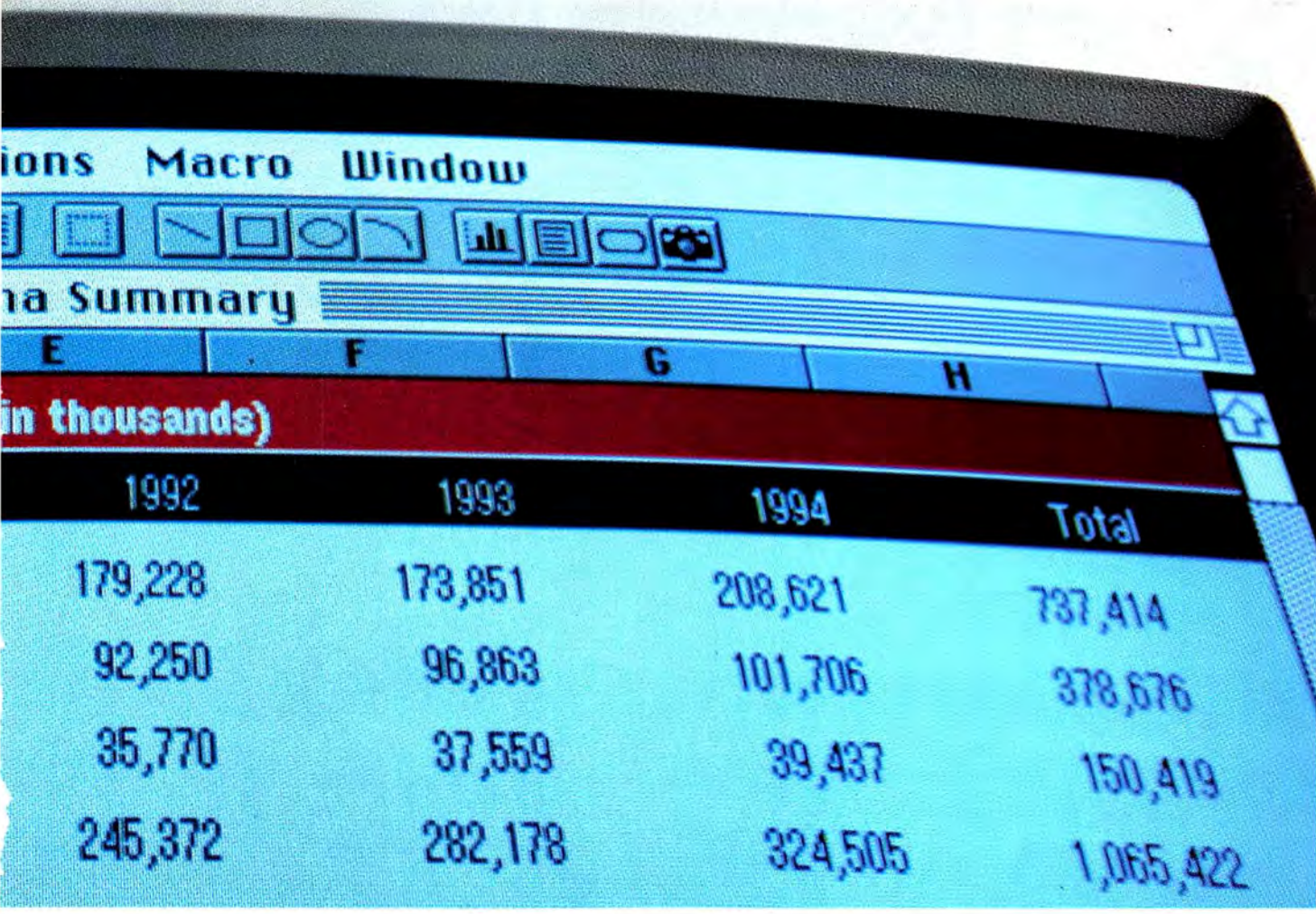
MacUSER LABS Tough tests, easy choices

HOT!

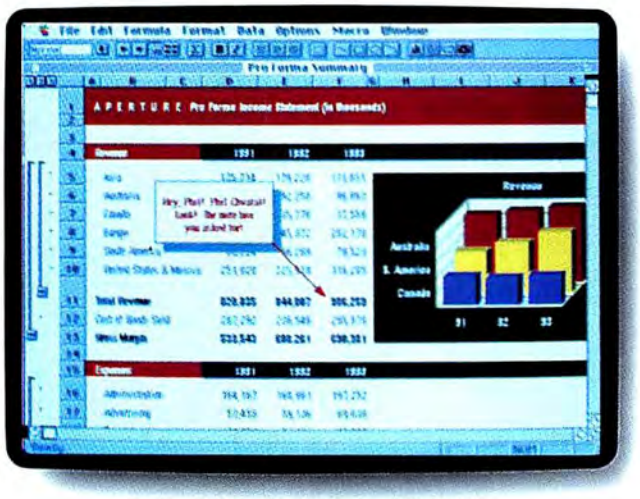


Apple's amazing DTP hardware





soft Excel version 3.0.



Yes, Paul, you can incorporate any of 68 chart types (24 of which are 3-D) right into your worksheet, along with text and data. And notice the outlining feature on the left? Go nuts.

Or the fact that this is the first System 7.0 application available?

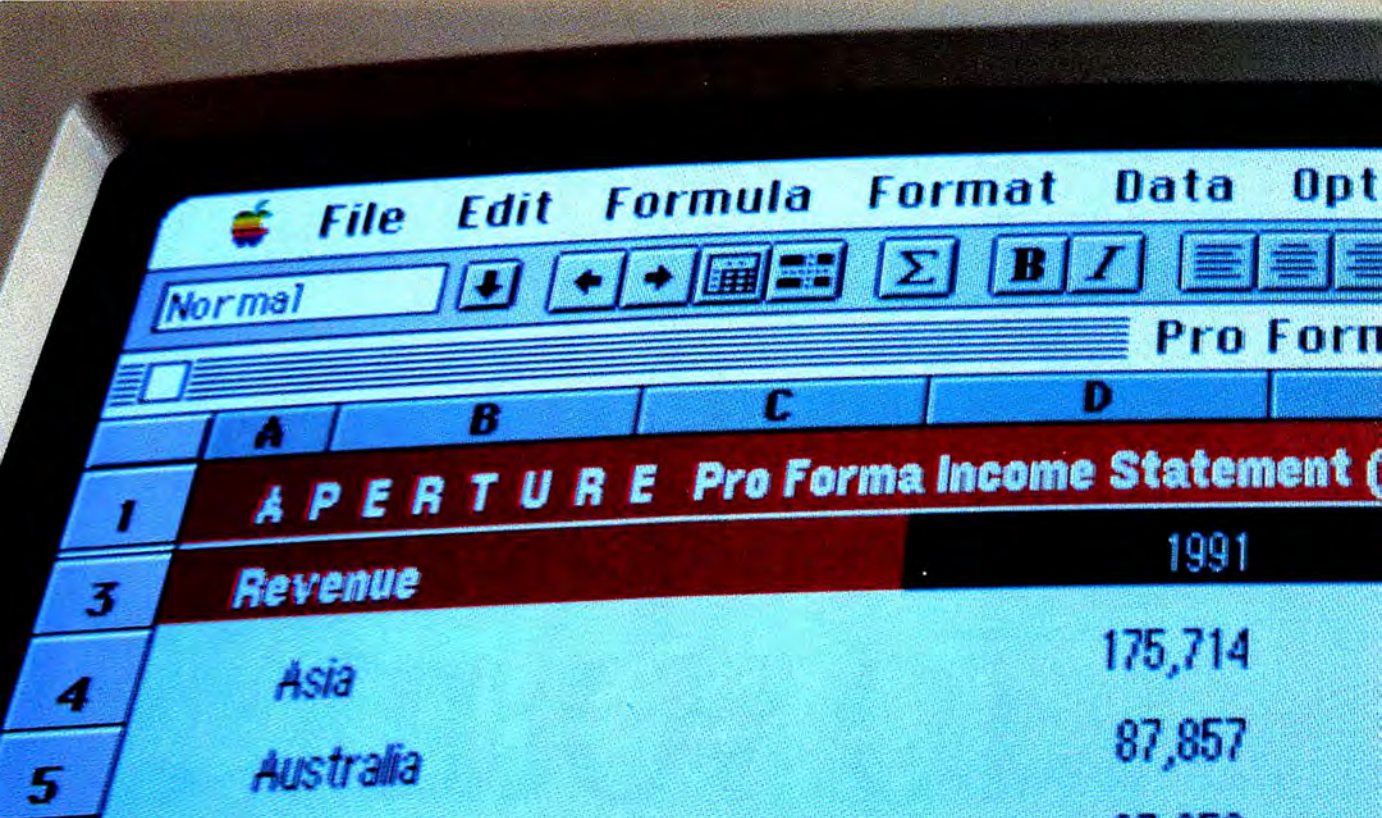
We did fall short in one area, however, with Ralph Levy's cat. Here in Redmond, we're not very well-versed in how to remove cranky, sharp-clawed felines from atop user manuals.

Let the cat have your old manual, Ralph. You'll get a new one when you update your version of Microsoft Excel for $129 (or $50 if you acquired it on or after 12/7/90). Call (800) 541-1261, Dept. Q80, to find out more.

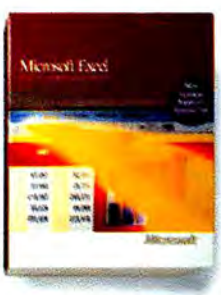
And by the way, Bryan Larson of Mission Viejo, California: we said hi to Bill for you. He sends his regards.

Microsoft

formation only: In Canada, call (416) 568-3503; outside the U.S. and Canada, call (206) 936-8661. © 1991 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and Autosum, Toolbar and Making it all make



Introducing Micros



Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

Well, Betsy, get a load of this. We think new Microsoft® Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac®. For one good reason.

Power made easy.

The new Toolbar™, for instance, reduces common, time-consuming tasks down to one step.

Highlight a row or column of numbers, hit the Σ button (that's Autosum™), and *voilà* – it all adds up.

Do quick, push-button formatting.

Use outlining features to collapse or expand worksheets without having to create multiple files.

As for charting, we took our cue from Paul Woods of St. Paul, Minnesota, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the feature called Goal Seek? Put in the total you want, and Microsoft Excel works backwards from there to fill in the variable you need.

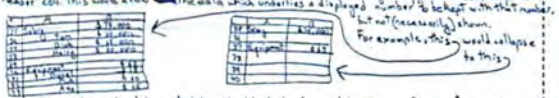
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We'd like to respond to your suggestions on how to improve Microsoft Excel.

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

"Collapsing Cells": Collapsing cells would be to a spreadsheet what outlining is to a word processor. A "collapse" command would allow a number of worksheet cells to essentially disappear and become part of a "header" cell. This would allow the data which underlies a displayed number to be kept with that number, but not (necessarily) shown.



For example, this 3 would collapse to this 3.

The collapsed cells would still exist, but would not be displayed or printed unless an "Expand" command were used. While it is possible to do this trick by setting row height to zero, it would be alot to have this be an automatic feature. Sincerely, John Broadhurst, Golden Valley, Minn.

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

System 7 0 support

Sincerely,
Ulises Ruiz

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

Incorporate a style sheet feature such as that used in MS Word - sometimes more often than not, I take a format that has been set up and would like to copy it with others and/or having it to a new document without recreating the cell style attributes in spreadsheets.

Thanks for your ongoing efforts!!!

Elizabeth Fischer
Durham, N.C.

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

How about being able to add notes as to the spreadsheet that have no effect on the cells. Example 2



Thank you
Phil Chastal

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

3D CHARTS

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

I've often said that if only Microsoft Excel were automatically what within Excel, I could do 90% of my work in Microsoft Excel. I'm an Economic Modeler on the Space Station Program during the Redesign Effort, and most of the job is Assessment Evaluation of Data, which involves both numbers and other graphic analyses in Excel.

Hope to see Listserv,
Mike Wood
Illuminated Realm, Co

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

Provide capability for What-If Analysis, so that once the dependent variable's final value is defined, it seeks the best of the independent variables that will help achieve that result. The current method is the trial-and-error, which is rarely exact and very inefficient.

Provide capability to integrate text, a portion of the spreadsheet and the graph, ie. integrated text and graphics to automatically prepare a presentation ready copy.

I look forward to seeing these capabilities in Microsoft Excel soon.

Sincerely,
Rajendra Sekaria
Chicago

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

BETTER CHARTING FEATURES.
3D CHARTS
DRAWING TOOLS?
THANKS
DON GAUTHIER

Microsoft
Making it all make sense

MacUser

NOVEMBER 1991

Volume 7 Number 11
Cover photo by Steven Underwood
Cover screen image by Peter Alan Gould
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MacUser LABS **Double-Duty Drives: Multifunction Optical Storage**
BY JOHN RIZZO AND THE MACUSER LABS STAFF
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MacUser LABS **Searching for Storage Perfection: 100-Megabyte Hard Drives**
BY OWEN W. LINZMAYER AND THE MACUSER LABS STAFF
Do you crave performance, or are you interested in value, service, construction quality, or portability? MacUser Labs pinpoints the drive for you in this showdown of thirty-two 100-megabyte hard drives. **124**

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BY KELLI WISETH AND THE MACUSER LABS STAFF
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"One thing that Apple left out of the Mac's desktop metaphor was the pair of legs sticking out from under the desk while you're trying to find out what your computer's getting itself into a tizzy about now." 213

Why is this Guy smiling?



Guy Kawasaki, Macintosh Evangelist

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MacUser

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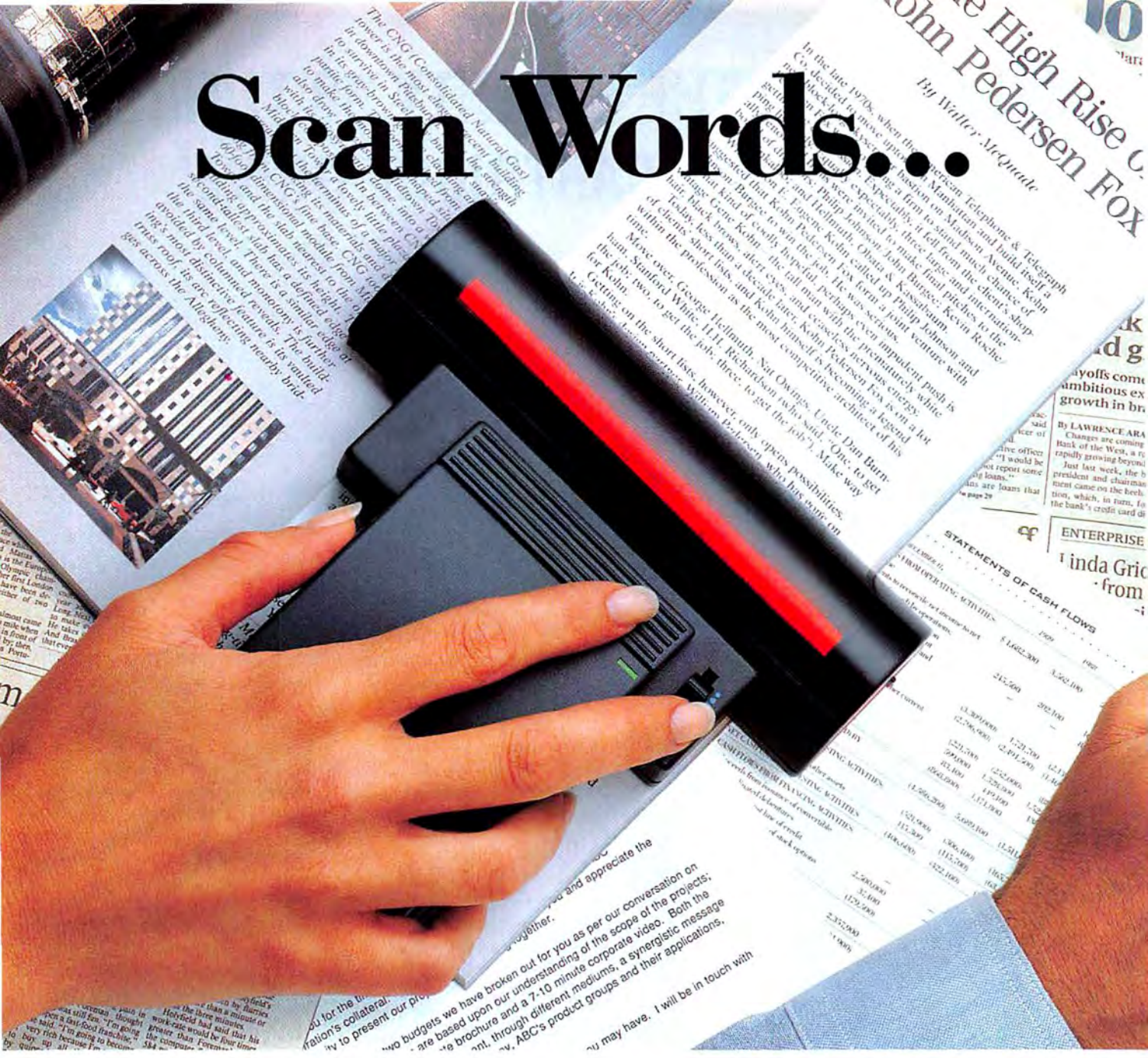
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Now Graphics.





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About MacUser

Let's Get Personal

When *MacUser* decided to launch Personal Macintosh, a new department covering products that individual users might use for individual Macs, we turned to two authentic individuals. One of them is the most prolific and widely read Macintosh-product reviewer of all time. The other is a celebrated novelist who has sold millions of books based on the premise that we're all going to be vaporized to make room for the galactic equivalent of a freeway overpass.

Obviously, we like people who have something to say about everything.

Steven Bobker should require no introduction to regular *MacUser* readers. Steve not only helped found the magazine (serving as the magazine's original technical editor) but he has also remained one of its foremost reviewers, having evaluated literally hundreds of products. He's now finishing a book for Bantam Computer Books entitled *Macintosh Power Tools.*



The universe's funniest novelist (Douglas Adams) and *MacUser*'s most prolific reviewer (Steven Bobker) are together at last in Personal Macintosh.

In Personal Best, Steve will continue to do what he's done so effectively all along — write about software and hardware. This month, in "Beginner's Bucks," he goes through a list of "must-buy" software and hardware to complement a low-end Mac. Look for Steve to be a regular contributor to Personal Macintosh.

A somewhat more *irregular* contributor (and we mean that in the kindest way) is Douglas Adams. Douglas, of course, wrote the four novels that make up the famous *Hitchhiker's Guide to the Galaxy* trilogy. He has also published two Dirk Gently holistic detective novels and, most recently, *Last Chance to See,* a wry account of his perilous travels to observe rare and endangered species such as the dragons of Komodo and New Zealand's kakapa parrot. In spite of all this activity, he has also found time to author four articles for *MacUser,* which by our count means he's already completed his first *MacUser* trilogy. We're sure you'll appreciate Douglas' account of his perilous travels down under his desk in a doomed effort to save an endangered SCSI chain.

Rounding out the Personal Macintosh section is associate editor Victoria von Biel's Shopping List, a monthly checklist of important factors to consider when buying a particular class of product. Say you're thinking about adding a new monitor to your system. What dimensions should you be looking at? Will you need a display card? Should you get color? What resolution? Shopping List is designed to make it easy for you to become a smart shopper quickly — before you're forced to live with your mistakes.

So, if you recently bought a Macintosh Classic or LC for your personal use (heck, you can buy a IIfx with 128 megs on the motherboard and the new Mitsubishi 37-inch monitor for personal use if you're so inclined — and your last name is Rockefeller), check out the opinions in Personal Macintosh.



Story

How FileMaker Pro makes one man seem like a cast of thousands.

FileMaker Pro

Jay Nathanson wears a lot of hats. His company – Target Marketing of Richmond, Virginia – is one of the fastest growing small businesses on the East Coast. Ask Jay to explain his success and he'll give you an uncharacteristically succinct response: FileMaker® Pro.

FileMaker Pro wears a lot of hats too. Jay literally built his business with it. He and his lean, mean staff use it to quickly research, quote, present, schedule, ship, label, invoice and generate checks and correspondence for every job. The entire staff can access that data simultaneously – and effortlessly. So almost any question a customer can think of can be answered *while they're on the phone.*

FileMaker Pro even closes Jay's books every month, in 45 minutes. As you might expect, those books look pretty good.

Jay Nathanson is just one of over a quarter-million people who benefit from FileMaker Pro. You can too. To see how call 1-800-729-2292, ext. 20.

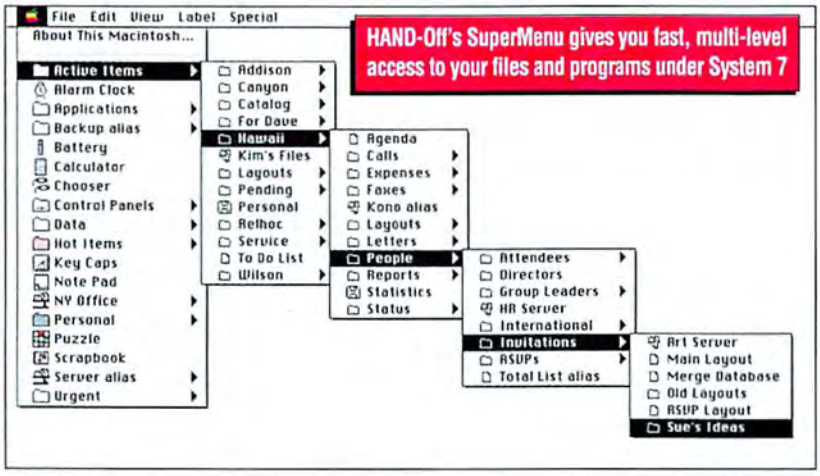
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For fast, easy file access, get new HAND-Off II



Get more done in less time with HAND-Off,™ the collection of productivity tools that make accessing files a snap. As MacWEEK said, "It's so good that Apple should have put it in their system software."

Here's how the new System 7.0 savvy version can make your Macintosh even more productive.

Locate and launch files fast using the Apple menu

Click open any document, alias or application directly from the Apple menu. Speed through your control panels with a mouse stroke. HAND-Off II's new SuperMenu™ turns the System 7.0 Apple menu into a multi-level hierarchy for viewing, launching and opening both folders and files.



Pop-up menus open many files simultaneously

Organize files and applications the way you work. With the HAND-Off II pop-up launch menu you can easily open any file or group of files. This custom pop-up menu is ideal for opening all of the letters, charts, spreadsheets and files associated with a project.

Finder enhancements for increased productivity

You can create custom settings for any application, so whatever is running, your Mac will automatically switch to the environment you prefer. HAND-Off II lets you individually set the color depth and sound level for any application. It's all automatic.

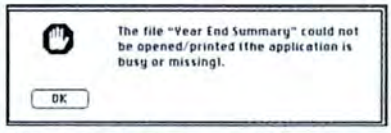
Run your Mac in full color when you use your favorite graphics programs. Then HAND-Off II will transparently change to the faster black and white mode when you switch to a word processing or spreadsheet program.

Moving through a clutter of overlapping windows can be confusing. Your desktop will be easier to use when you pair HAND-Off II's new Autohide feature with System 7.0. Autohide lets you automatically hide all windows except the ones that your current application is using. The result is a cleaner, more productive desktop.

Automatic substitution for your missing applications

Say goodbye forever to the annoying "Application Not Found" message. If the program you need is missing, HAND-Off II's application substitution will automatically use an alternate.

Now, whenever you click on a file, you can automatically open a compatible alternate application.



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You can even pre-assign application substitutions. HAND-Off II lets you double click on any file–even one from a DOS machine–and automatically open it using a compatible alternate program.

Get HAND-Off II, the productivity tool that MacUser rates five mice. Call your software supplier or Connectix direct at (800) 950-5880 or (415) 324-0727.

"This utility is definitely in a league with Suitcase II–and it's indispensible."

– MacUser, February 1991

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LETTERS



We're used to John C. Dvorak stirring up a little controversy—in fact, we'd be disappointed if he didn't. But even we were surprised at the mound of mail we received regarding his August "Wimp Processors" column (page 236). Our favorite response came from Jerzy Lewak, president of Paragon Concepts, the publisher of Nisus, the Swiss-army knife of word processors: "It is with great pleasure that I inform John Dvorak that his wishes have been granted retroactively! Is it not a miracle that this came to pass at least one year before his article appeared?" Make that the razor-sharp Swiss-army knife of word processors. For more on words and wimps, see the end of this month's Letters.

✉ *Write to Letters to the Editor, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of Zmac, our on-line service.*

All letters become the property of MacUser, *and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.*

Upgrade Inflation

Ever since the hullabaloo began about software companies' responsibilities to loyal customers (if the companies want to see an end to software piracy), most upgrade prices have been reasonable — anywhere from nothing for bug fixes to $25 for major feature upgrades and around $10 to $15 for compatibility upgrades. You can imagine my shock, then, when I was told by La Cie that the Silverlining System 7-compatible upgrade was $50. I originally paid $78 for the program.

I wouldn't have bought Silverlining in the first place if I had known La Cie was going to exploit a situation in this way.

Loy Spurlock
La Mirada, CA

Silverlining retails for $149, and the company considers the new version to be a major feature upgrade. Owners of the previous version (5.28) can upgrade for $10. In any case, we'd hate to think that publishers should feel obliged to price upgrades reasonably or expect their customers to steal from them if they didn't. — JB

Toaster Master

"**P**utting Your Mac on TV: Desktop Video" (August '91, page 94) was a great article that really highlighted the fact that no single computer can do everything at a professional level. The Mac is truly one of the greatest personal computers for DTP, but it's *not* really suited for video. Selecting the appropriate tools for the job is an important element in successfully completing a project, and a Toaster-equipped Amiga is the tool of choice for video.

It's refreshing to see articles that "call 'em like they see 'em," even when the final analysis reveals a preferred platform that isn't what the intended audience expects to find.

Larry Owens
Seattle, WA

TV Stand

"**A**lthough a Mac-produced video will never be good enough to air on MTV, don't be disappointed" So says your lab report "Putting Your Mac on TV: Desktop Video" (August '91, page 94). Sorry to disappoint you, but we produced a 30-second public-service announcement for gun control that was broadcast on MTV. It was 100-percent Mac — audio and video. We used a NuVista+ with the Truevision XOBJV in MacroMind Director.

Although we concur with your appraisal that the NuVista+ and its software is the best Mac DTV product, we cannot figure out how you can say it does not meet NTSC (broadcast) standards.

Dear Mr. Sculley . . .

Well, the lamb has lain down with the lion. Apple and IBM are cooperating in the development of (among other things) a new operating system, code-named Pink. The pundits are unanimous: It's either the smartest or the dumbest thing Apple could do.

Speak Up:

Is Apple signing its own death warrant by joining forces with IBM?

✉ *Send your thoughts to Dear Mr. Sculley, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404.*

As Mr. Sculley looks toward Apple's next-generation operating system, some Mac users are still hesitating about jumping on the current bandwagon. In August we asked readers whether they planned **to switch to System 7.** Many cited cost and concerns about compatibility as reasons not to switch.

Larry Hacker, of Mabelvale, Arkansas, was ready to try System 7 but stopped before he really got started. "When I ran the Compatibility Checker, I found that I had only one program that was compatible. I called Apple, and all I received were condolences." Actually, the condolences may be due to Apple for having put so much effort into creating a software program that often seems to scare people away from its own system software.

Bruce Long, of Tempe, Arizona, plans to switch only when "it can be reliably demonstrated that hell has frozen over. I consider System 7 to be the Edsel of system software. At least three of the applications I use most frequently are incompatible, and with System 7 you are chained to MultiFinder every moment your Mac is in use."

Charlotte R. Hitchcock, of New Haven, Connecticut, won't switch in the near future, because the cost seems unnecessary. "I have no money to spare for an expensive upgrade. I can't afford any new software either, so why bother when 6.0.5 works OK?"

Another chea—, er, thrifty reader is David Robertson, of Spokane, Washington: "It would cost a lot to upgrade all the applications I use, and Apple is charging $100 for something that Mac users have always received for free. If I could get System 7 for free, I'd try it to see if there were things I could learn to do without. But do without some of my favorite INITs — Boomerang, for instance? I doubt it." Actually, no one need do without Boomerang. A System 7-compatible version of SuperBoomerang should be available soon.

What's the Difference between a Font and a Typeface?

...And what's all this about PostScript versus TrueType? Is there a difference between tracking and kerning? What is an outline font, anyway?

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CIRCLE 22 ON READER SERVICE CARD.

Mixing the Mac and TV is like sticking a Porsche engine into a VW Beetle. But if the engineering is sound and you learn how to drive it, it works!

Jim and Charlie Rice
Linden, VA

Our comment that the signals from all the Mac video products were not "broadcast quality" was specific to the composite output from the video boards. In the "Bottom Line" sidebar, we made it clear that you can get clean broadcast-quality signals if you take the RGB output from the NuVista+ and use an industrial encoder to convert the signal to a composite or component signal. — PY

In-House Work

Boy, were we surprised to learn that the original development work on Microsoft Excel for the Mac was done externally ("Spreadsheet Skirmishes," August '91, page 29)!

In fact, Robert Wiggins is wrong. In the fall of 1983, on a retreat for key-application developers, Bill Gates challenged us to develop the "world's greatest spreadsheet." In September 1985, we shipped Microsoft Excel for the Mac.

As the group product manager throughout the development of version 1.0, I can assure you that all the original design and development work was done internally, by Microsoft employees.

Pete Higgins
Vice President, Analysis Business Unit
Microsoft Corp.
Redmond, WA

System 7-Savory

All the bellyaching over the "incompatibilities" of System 7 is just that —bellyaching. Despite what Apple's Compatibility Checker says, I've found none of my commercial programs totally incompatible. For instance, I can still use Microsoft Word 3.02, as long as I don't use TrueType fonts. And I can still use many INITs, such as Boomerang 2.0, PopChar, Superclock 3.9, Moire 3.0, and Virex 3.1, after a little putzing around to figure out the best place to put them. After a modest taste of Apple's System 7, I think Jon Zilber's recipe for System 8 ("Compatibility Checkmate," August '91, page 23) sounds about as appealing as DOS 5.0.

Ken Trammel
St. Louis, MO

If the FDA released a list of foods guaranteed not *to cause cancer, would you risk ingesting something that wasn't on that list? You might, but if Apple is going to put its imprimatur on what's safe and what's at your own risk, the company incurs the responsibility to keep the list current and distribute it frequently — at no charge to registered users. — JZ*

Checkers Speech

Regarding Figure 6 on page 122 of your September '91 issue ("Proper English"): At first I thought it might have taken to long two use the grammar checker too allow a spelling checker too be used to. Then it occurred to me that the ambiguities of the English language are simply to much for any help program too catch, so use of these automatic assistants ain't no guarantee that you will produce "perfect English."

Two bad too.

Bob Hunt
Santa Ana, CA

Your write, but the grammar checkers are supposed too flag homophones, which spelling checkers buy necessity miss. Look more closely, and you'll see that's why we put them there. Many people actually find this feature annoying, but you might like it. — JB

Deficit Defending

Andy Ihnatko takes a swipe at those of us who work for the government in the May '91 Help Folder (page 275) when he says that the expensive solution was not the one to be hoped for "unless, of course, you . . . work for the government!"

Let me inform Andy that *no* use of stereotypes is permissible in professional writing! This kind of thing is no different from ethnic jokes.

Working for the government never meant unlimited funds, but now it means no funds at all! In the past three years, I have attempted to get just one more Mac for the office to further increase our productivity — but the dollars are just not there.

The government isn't rich, shouldn't be, and never has been, overall. Don't pick on the people who dedicate their lives to making it work as well as it does.

Don C. Warren
Aberdeen, MD

In all seriousness, let me extend my most sincere apology. It was never my intention to take a swipe at those who work for the government. I was actually taking a swipe at those within the Beltway who are utterly devoid of any sense of humor. — AI

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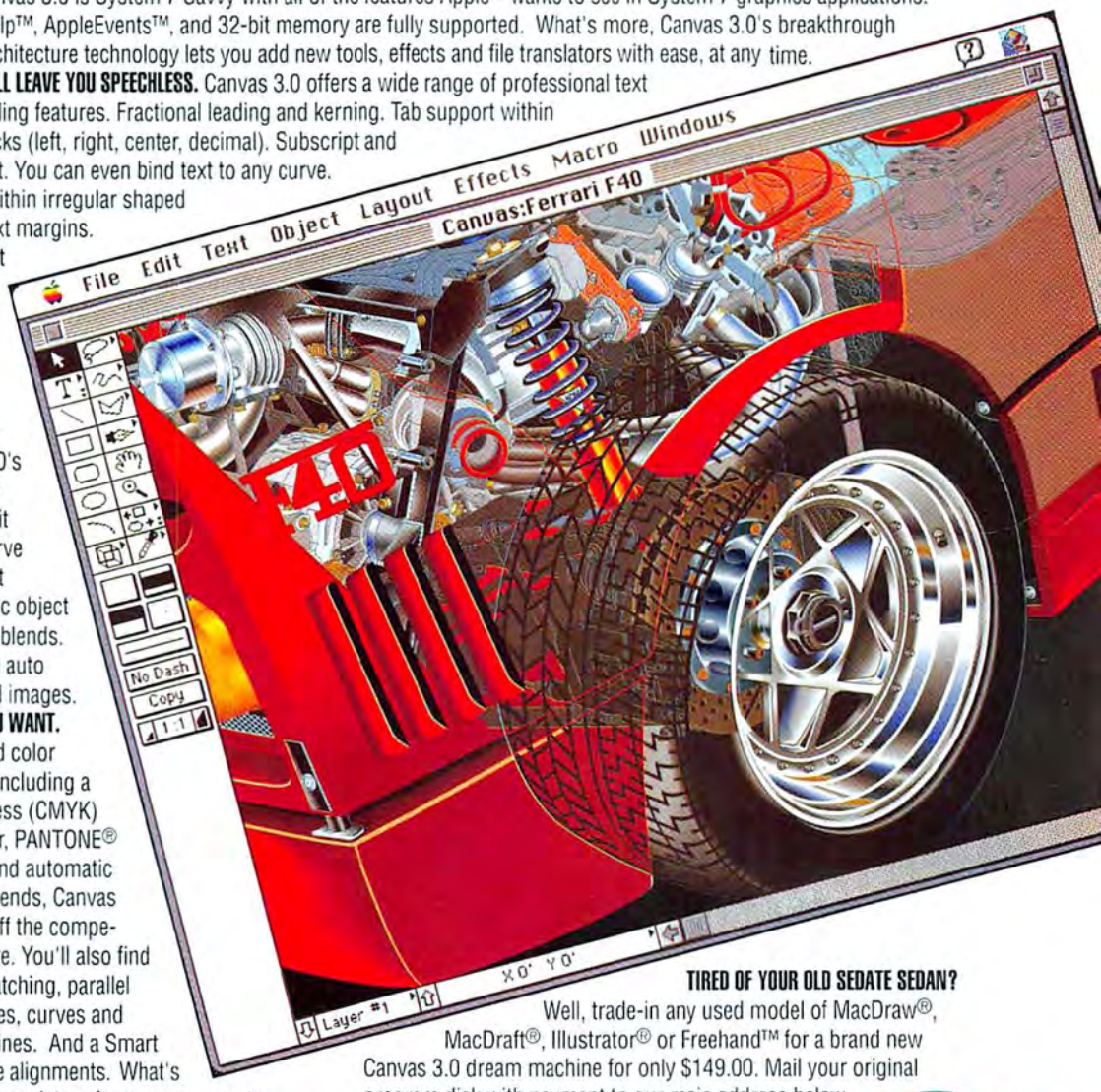
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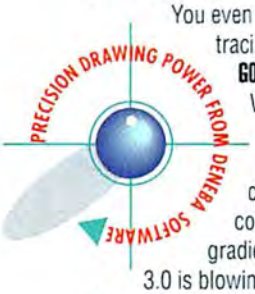
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LETTERS

The Last Round Up

On reading Bob Kimble's Tip of the Month (Tip Sheet, September '91, page 269) concerning the rounding of numbers, I couldn't help but wonder what my high-school chemistry teacher would think of his rounding technique.

Scientifically, the rule is that when you round to whole numbers, an exact half number of .5 is rounded to the *even* number — not to the *next-highest* number, as the result would always be using Mr. Kimble's formula.

"Incorrectly" rounding a student's grade of 84.5 percent up to 85 percent rather than down to 84 percent could mean the difference between a B– and a C+. My chemistry teacher never gave anyone the benefit of the doubt (although I'm not *necessarily* speaking from personal experience).

Jay J. Jacobs
Western Springs, IL

PC Intrigues

What Guy Kawasaki can't tell us, we can infer from his column "Sleeping with the Enemy" (September '91, page 29). Several years ago, Apple and Microsoft secretly settled their lawsuit. Thus, Microsoft wrote System 7 — a technical step forward but as user-hostile as Word 3.0. In return, Apple promised Microsoft that it would foist the TrueType format on IBM (as well as on Mac) users; sweet revenge by two old antagonists upon the third (as well as on Adobe, which committed the unpardonable sin of offering a single, simple standard — PostScript).

I'm aware that there's pain in progress — adapting to new operating systems, hardware, and so on — but if Apple continues to kludge up the Mac's elegant simplicity with giant leaps of incompatibility instead of thoughtful, gradual improvement, I will surely pause to consider what's NeXT.

Brad Nelson
Bremerton, WA

Getting His Backup

Regarding the article "Overnight Success: Network Backup" (August '91, page 112), I don't know where you're purchasing 8-millimeter-tape cassettes that "cost about $60," but our source sells standard-grade cassettes for less than $5 each in bulk (100 cassettes). Premium-grade D8 (data, 8-millimeter) cassettes can cost upward of $12 in single quantities. It will be some time, if ever, before DAT is as easy to purchase as 8-millimeter tape is.

I fully agree with your criticisms of NetStream: clumsy interface, slow backups, and no ability to restore directly to the client. I hope that version 3.0 will fix some of these problems. There were some inaccuracies in Table 1, however. Contrary to the information in your table, a client can cancel a backup with NetStream if you press Command-period at the time of backup or remove the client RBS (Remote Backup Set) from the System Folder to prevent a future backup.

The client can force backups to be encrypted by using either a proprietary PCPC scheme or standard DES encryption. You can find this in the Set Preferences for Security menu.

You can write-verify by selecting the Check Disks: During option on the Set Preferences for Backup menu.

One question I had wasn't answered by your review. NetStream will not find files to back up if the name of a disk drive, a file folder, or the file itself has been changed since the creation of the RBS. Is this a fault common to all the backup programs you reviewed or only to NetStream?

John H. DeRosa
Arlington Heights, IL

We didn't intend to dismiss 8-millimeter-tape drives. Your points about availability and cost are good ones. To level the playing field, however, we had to test the network-backup software on a common platform. DAT was the only one that all *of the software products would run on.*

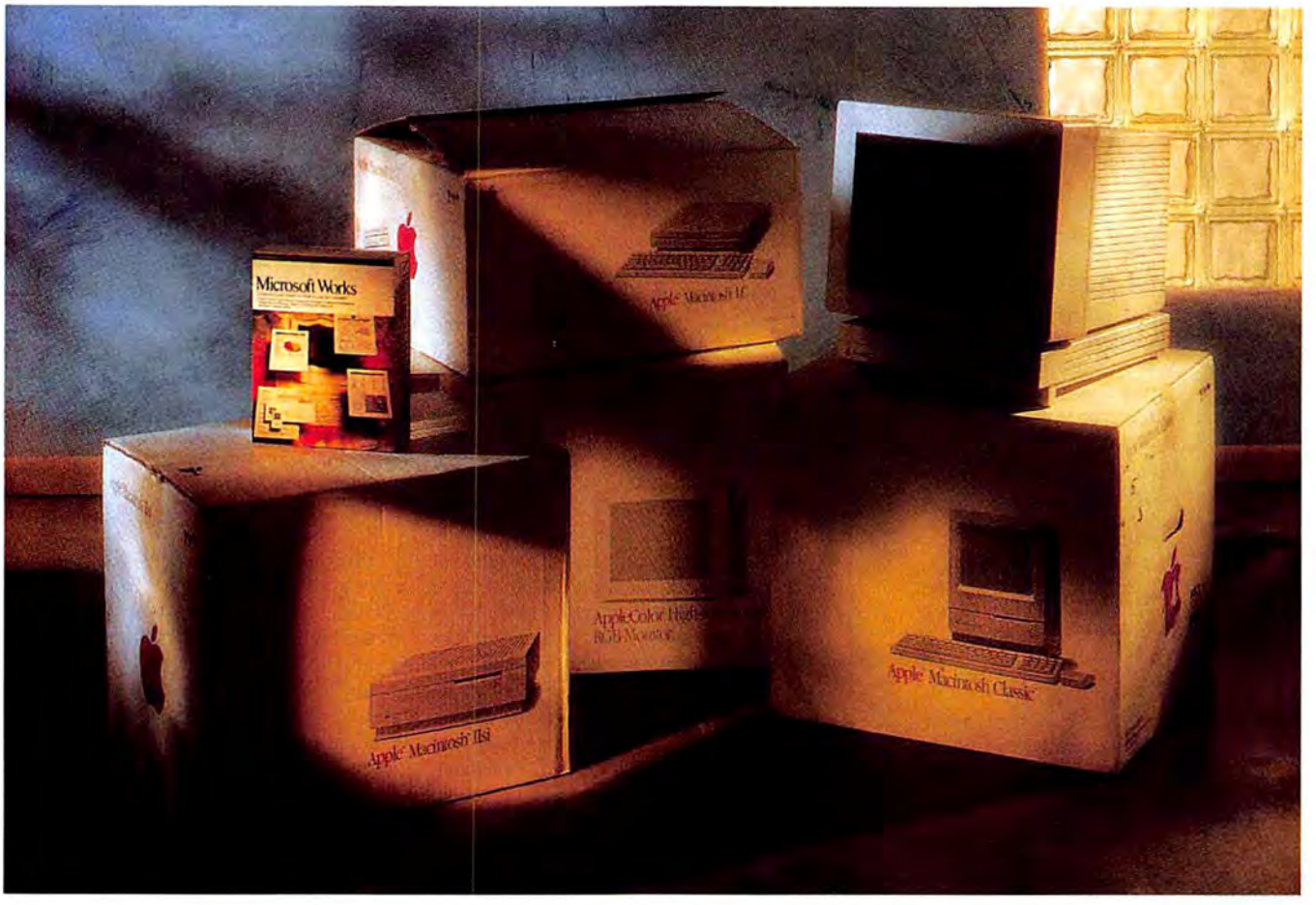
As for your unanswered question, you can rename hard disks, folders, and files without stumping Retrospect. — KW

Who Shipped First?

We were pleased with the in-depth information provided in the review of SAM 3.0 (August '91, page 75). However, we'd like to mention one small inaccuracy. Under "Virus Alert," you stated that Virex "is also currently the only program that combats an unconventional HyperCard virus that originated in Europe." This virus was discovered on April 1, 1991, in Belgium. Symantec responded immediately — issuing both user definitions and a virus-definition file by eight o'clock that night. Our response came weeks ahead of Microcom's because of code changes necessary for Virex to address the new virus.

Elizabeth Hemeryck
Product Management
Symantec Corp.
Santa Monica, CA

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CIRCLE 67 ON READER SERVICE CARD.

LETTERS

When we called Microcom in mid-April, we were told that its response was ready, which turned out to be a premature assessment. At the same time, we called Symantec's tech support and were told a HyperCard virus response wasn't available, even though apparently it was. We regret any confusion caused by these errors. — BT

Free Medicine

You left out Disinfectant, the best virus checker around, in your August '91 review of SAM and Virex (page 75). When you manage a few hundred Macs, it is unfeasible to purchase 200 copies of SAM or Virex when you can get the same protection for free.

Ben Olken
Sharon, MA

Revenge of the Wimps

For years I've resisted the urge to write this letter, but the Dvorak article on word processors ("Wimp Processors," August '91, page 326) finally nuked my resistance. You're not paying him for his misinformed ramblings, are you?

Dvorak did, inadvertently I presume, incorporate one interesting insight. If you concatenate the first and last sentences in his first paragraph, it reads: "Word processing on the Mac hasn't improved one iota since MacWrite came out seven years ago. Now many word processors for Windows and the PC are as powerful and easy to use."

Did he really mean to admit that it has taken the PC world seven years to catch up with where the Mac world was seven years ago? That's not what he's been saying for the past seven years!

C. J. Thompson
San Clemente, CA

If you looked over John C. Dvorak's copy before publishing it, you might be able to prevent him from making a fool of himself in public. In "Wimp Processors," for example, he writes of a "hypothetical situation" in which a "complex table" resides on page 2 of a 100-page document. He wants to change all of the document except the table from one typeface to another, but, he laments, "There's no way to deselect this little chunk."

Has he actually *used* a Mac word processor lately? In Microsoft Word, the change can be made in six quick steps.

Frank Kofsky
Benicia, CA

John C. Dvorak complains about some "missing" features that he wants in his word processor, but he apparently never bothers to read his manuals, because Microsoft Word can easily handle his items 5 and 6. As for most of his other items, I personally hate the growing featuritis of all software. I used to think that 80 megabytes was a reasonable size for a hard disk, but when a spreadsheet program or word processor hogs 5 megs for its glow-in-the-dark menus and dancing topless icons, I'm stuck with being able to use fewer than 20 applications.

I suggest that you create a sister magazine entitled *MacUser sans Dvorak* — the circulation potential is enormous. For now, would you please simply remove the last page from my issue before mailing it?

Gary Kowalski
Santa Ana, CA

It's clear from John C. Dvorak's August column that he's never used Nisus. With the exceptions of automated envelope printing and new special effects (who cares?), Nisus already does everything on his word-processor wish list.

Jon H. Clinch
Harleysville, PA

With regard to his August column, I am forced to conclude that Mr. Dvorak was secretly paid by Microsoft to goad hundreds of Word users into writing testimonials.

Mr. Dvorak's remarks remind me of the man who took his car back to the dealer for a refund, bitterly complaining that it leaked when he drove it underwater. If he truly requires the shrunken heads and rubbery margins of "a good desktop-publishing program," then maybe he should use one. Or maybe he should invest some time in practicing with and studying today's high-end Mac word-processing programs.

Rick Conner
Beltsville, MD

John C. Dvorak was right on in his indictment of Mac word processing.

Except for one thing. I don't know about the other products, but in WriteNow 2.2, he need only follow these simple steps

Robert Jarling
Madison, WI

Mr. Dvorak was unavailable for comment — he's busy trying to find a Mac spreadsheet program that can handle 3-D graphics. — JZ

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Man Heaving 75-lb. Boulder.

Woman Emptying Bucket of Water on Seated Companion. Man Balancing on One Foot. A ballet for eccentric acrobats? Yes, but at the time, also the world's most ambitious photographic research project. Refining the techniques he developed taking pictures of Leland Stanford's race horses in California, Eadweard Muybridge produced 100,000 negatives in the span of a year and a half.

On a good day, he would take five or six hundred 4 x 5 pictures. — In your own quest for fresh insight, which type for the Macintosh® will be your most faithful servant? Perhaps it will be type from the foundry that spares nothing when it comes to capturing the original. Bitstream, where the spirit of type burns brightly. Where the kerning is exquisite. Where people go to outrageous lengths to preserve the integrity of a type designer's dream. Where our library of over 1,000 faces is growing all the time. Call to order or ask for a complete showing of PostScript®-compatible fonts. Bitstream. Labor of love.

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CIRCLE 134 ON READER SERVICE CARD.

Some things are clearly built for speed.



Hang on! At 17 pages per minute, the new HP LaserJet IIISi printer for the Macintosh runs full tilt. And while other machines may keep you waiting, this one whips through PostScript® printing. With a high-speed engine, more standard memory (5MB, expandable up to 17MB), and a RISC-based formatter, this printer can have your work finished faster than you can shout "the Hewlett-Packard LaserJet IIISi for the Macintosh."

What's more, the built-in true Adobe® PostScript makes this a LaserJet printer manufactured specifically for Macintosh. Simply plug into the LocalTalk network, and your workgroups are ready to roll. Also, the two 500-sheet input trays, a 500-sheet output capacity, and a 50,000-page-per-month duty cycle ensure that it can handle high-volume printing. In addition to quick turnarounds, you gain paper-handling versatility with job offset and a tray-full sensor. And for even greater flexibility, you have the option of adding two-sided printing and an envelope feeder.

Yet what makes all of this worth the ride is the end result.



Others aren't so obvious. Introducing the LaserJet IIISi for the Macintosh.



Thanks to our Resolution Enhancement technology and microfine toner, which uses particles 50 percent smaller than other 300 dpi laser printers, your work will have a quality which rivals that of 600 dpi printers.

Perhaps the best news of all is the price. The LaserJet IIISi printer for the Macintosh is only $6,995.* So if you're interested in affordable, express printing with the service and reliability you've come to expect from Hewlett-Packard, call **1-800-752-0900, Ext. 2607**† for the name of your nearest authorized HP dealer. And discover the printer that will take your breath away.

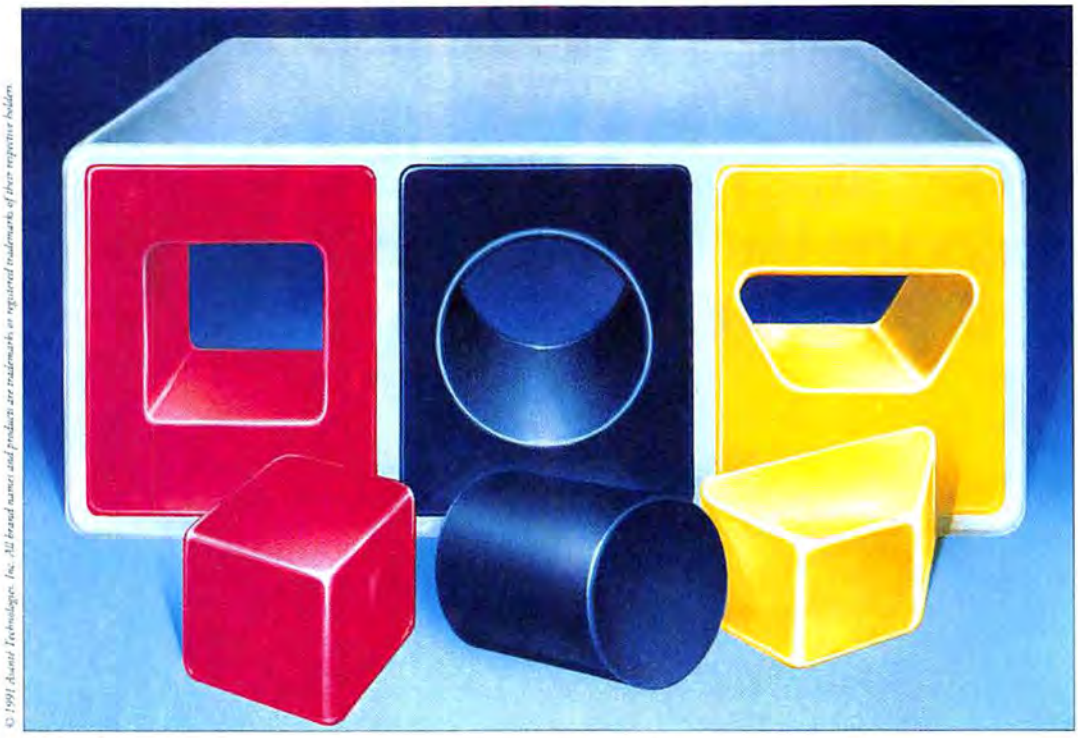
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CIRCLE 162 ON READER SERVICE CARD.

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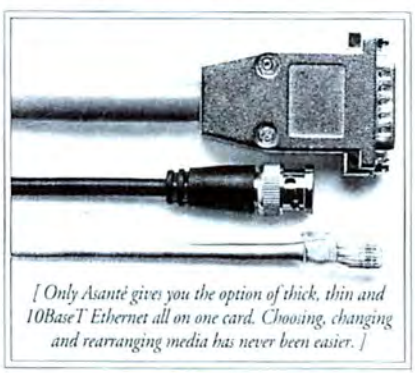
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[Asanté products have on-board ports for all three Ethernet media. It's a system for today that you'll never outgrow.]



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CIRCLE 37 ON READER SERVICE CARD.

JON ZILBER

The Uncivil War



How to succeed with bureaucracies without really trying — and get the Macintosh or upgrade you've always wanted.

It wasn't like I was trying to orchestrate a leveraged buyout of Sony or anything. All I wanted was a box of floppies.

But that's bureaucrats for you. You can't live with 'em, you can't live without 'em, and you can't get 'em to get you a box of floppies without jumping through hoops in triplicate.

Just try and get Them to approve the purchase of a new Mac or CPU upgrade when They're convinced that a 286 clone is the ideal machine for you. All of Their paperwork and requests for justification just take too much time. And after all, time is what you don't have enough of — that's why you need the faster machine in the first place.

If you've ever been frustrated by a rejected request for the Mac equipment you want, you need an arsenal of strategies to get results.

What it comes down to is simply this: It's war, between Us — the Mac users who understand the products and what they can do for us — and Them — the paper pushers and keepers of the purse strings who understand how a carefully worded set of contradictory company guidelines can keep Them from having to fulfill any request that comes their way.

Bureaucracies generally work according to clearly defined rules known only to the people who set them up — who have long since left the organization. Pinning down those rules is often a Catch-22 of Olympic proportions. If your request for something gets turned down because you didn't follow the rules, the logical next step is to ask to have the rules explained. But *that* request gets turned down because you didn't follow the rules for policy-clarification requests.

Face it — all bureaucrats worth their rubber stamps have more objections than Perry Mason in a cranky mood. But here are three strategies for overcoming the obstacles and getting the hardware and software tools you need to get your job done.

I. Up the Ante

One surprisingly effective way to get things past the bureaucracy is to up the ante. A simple matter — such as a request for a box of floppies — easily falls through the cracks. It wasn't budgeted. Nobody knows whether to code it as "computer supplies" or under "incidentals." There's no designated in-house floppy guru to consult on the choice of brands.

But give the bureaucrats something juicier to sink their teeth into — make it a request for "personal computer subsystem storage media provisions restocking" — and they'll get on it right away. They'll get a whole committee on it right away. And they'll even give it an acronym — PCSSMPR — before you can say "single- or double-sided?"

But the up-the-ante strategy works only if you have the time — and the stomach — to follow through: to outcommittee their committees, to outmemo their memos, and to outjargon their gibberish.

II. Strike Preemptively

Education is the shortest distance between two points — two points of view, that is. Get Them to see things your way before you even ask the question, and they'll be predisposed to grant your request with a smile and a pat on the back.

Fortunately, the job of preemptive education may not be as gargantuan as it might seem. If the letters we get from readers are any indication, the same reasons for turning down requests for Mac equipment come up over and over again. The same misguided notions about the Mac permeate corporate America, all levels of government, and even many so-called institutions of higher learning.

The solution here is obvious: Start a chain letter. You know how it works: Send a copy to ten people, each of them sends a copy to ten people, and so on. Before long, two things will happen: (1) There will be more copies of this letter floating around than there are unopened free copies of Windows 3 on the shelves, and (2) you'll notice a marked rise in the frequency of visits from your copier repairman.

Here's the text of the letter:

This is a chain letter. Follow the chain, and you will have good luck. Break the chain, and you will have bad luck. Arnold Kaplotnik, of Happinac, Wyoming, followed the chain and successfully installed System 7 without a hitch. Edna Willoughby, of Dosville, Nevada, broke the chain and bought a Mac SE the week before Apple introduced the Classic for half the price.

This letter dispels the ten most frequently cited misconceptions about the Macintosh. Photocopy this letter, and send it to any ten bureaucrats in your organization who have ever turned down your request for bigger and better Macintosh equipment. Use a yellow highlighter to call the recipient's attention to the lame excuses used to turn you down.

Myth No. 1: Macs are too expensive.

The Mac Classic ended this myth once and for all. Try finding a DOS clone powerful

enough to run a graphical user interface with a monitor, networking, HyperCard, and operating-system software for anything close to the price of the Classic. A decent range of low-priced CPUs lets you add exactly the color, performance, and expansion capabilities you need.

Myth No. 2: The Mac doesn't run the key applications we need.

Macs have become well-versed in virtually all the dominant DOS products. Everything from WordPerfect to NetWare to Oracle has been available on the Mac for years. The final (and perhaps the most critical) holdout — Lotus 1-2-3 — was due to ship any moment as of this writing, and it looks like a winner.

Like the aforementioned products, Lotus provides a graceful way for potential Mac users to migrate to the Mac. Lotus Mac even provides an instant toggle between two interfaces: one that exploits the Mac's graphical interface and one that offers Lotus experts a familiar — if less intuitive to novices — replica of the DOS-style Lotus interface.

Myth No. 3: Macs are wimpy.

Give me a break! Sure, the 128K Macs had their limitations. The original IBM PC was no powerhouse either. Neither was the Commodore 64, although that never stopped it from becoming the best-selling computer in the world.

Get real. Have you driven a IIfx lately?

Myth No. 4: Apple doesn't offer any truly portable machines.

Apple has promised to enter the notebook marketplace by the end of 1991. Although the company hasn't publicly released any details, you can be sure that Apple has learned its lessons from the less-than-stellar response to the first Mac Portable. And Apple's stated intention to pursue low-cost consumer electronics promises to take portability into directions that IBM-compatible computers seem to be overlooking.

In addition to Apple's forthcoming products, Mac users already have a wide range of portables to choose from, including products from Outbound, Colby, Dynamac, and others. If you need more options, DOS-to-Mac transfer software makes DOS notebook computers viable companions to Mac desktop machines.

Myth No. 5: You can't get here from there.

Because everybody has to share files, everybody has to use the same computer, right? And if the computer everybody else already uses is a PC, nobody gets Macs, right? Wrong. DOS-to-Mac file transfer is built in at the system-software level, and third-party products make it even easier and more completely transparent. You can even get full DOS emulation on a Macintosh with the SoftPC family of software products or the Orange Micro 386-on-a-board.

A host of new products has finally provided the missing link in the opposite direction. For Mac-to-DOS transfer, you can get file-exchange compatibility with

Most Printers *are* Macintosh® Compatible! Is Yours?

Printer	Type	Grappler	Notes
Alps			
ALQ200 Series	24 Pin	Grappler LX	6
ALQ300 Series	24 Pin	Grappler LX	6
Allegro	24 Pin	Grappler LX	6
ASP 1000	9 Pin	Grappler 9 Pin	1
P2000+, 2100	18 Pin	Grappler 9 Pin	1
P2400	18 Pin	Grappler 9 Pin	1
AT&T			
AT&T 450	Daisy	None	
470 Series	9 Pin	Grappler 9 Pin	5
495	Laser	Grappler LX/LS	9
570, 571	9 Pin	Grappler 9 Pin	1
Blaser			
Star 2	Laser	Grappler LX/LS	9
Brother			
1109	9 Pin	Grappler 9 Pin	2,11
1209,1509,1709	9 Pin	Grappler 9 Pin	1
M-1909, M-1809	9 Pin	Grappler 9 Pin	1
1724	24 Pin	Grappler LX	6
HL-8	Laser	Grappler LX	9
HR Series	Daisy	None	
M-2518, 4018	18 Pin	Grappler 9 Pin	1
TwinWriter	9 Pin	Grappler 9 Pin	1
Canon			
BubbleJet10e	InkJet	Grappler LX	
A-60		None	
CIE America			
LiteWrite	9 Pin	Grappler 9 Pin	1
Centronics			
PS210,PS220	9 Pin	Grappler 9 Pin	1
C.Itoh			
1550S+NLQ	9 Pin	None	
C-210, C-215	9 Pin	Grappler 9 Pin	1
C-310, C-315	9 Pin	Grappler 9 Pin	1
C-715	24 Pin	Grappler LX	7
C-815	24 Pin	Grappler LX	8
CI-2500	9 Pin	Grappler 9 Pin	5
CI-4000	9 Pin	Grappler 9 Pin	1
D10-40, F10-55	Daisy	None	
Jet-Setter	Laser	Grappler LX/LS	9
Lips 10+	Laser	Grappler LX/LS	9
ProWrtr Jr.+	9 Pin	Grappler 9 Pin	1
8510	9 Pin	Grappler 9 Pin	
Citizen			
120-D, 180-D	9 Pin	Grappler 9 Pin	4
124, 224	24 Pin	Grappler LX	7
GSX-140	24 Pin	Grappler LX	
GSX-200	9 Pin	Grappler 9 Pin	
MSP-10, 15E	9 Pin	Grappler 9 Pin	1
MSP-50	9 Pin	Grappler 9 Pin	1
Data Products			
9030, 9040	9 Pin	Grappler 9 Pin	1
9034, 9044	24 Pin	Grappler LX	6
DCS/Fortis			
DM-2215, 1310	9 Pin	Grappler 9 Pin	1
Diconix			
150	12 Pin	None	
300W	9 Pin	Grappler 9 Pin	1
Epson			
EX Series	9 Pin	Grappler 9 Pin	1
FX-80, 80+, 85	9 Pin	Grappler 9 Pin	1
FX-86E,FX-185	9 Pin	Grappler 9 Pin	3,11
FX-100,FX100+	9 Pin	Grappler 9 Pin	1
FX-286	9 Pin	Grappler 9 Pin	3,11
FX-286E	9 Pin	Grappler 9 Pin	3,11
JX Series	9 Pin	Grappler 9 Pin	1
GQ3500	Laser	Grappler LX/LS	9
LQ500	24 Pin	Grappler LX	
LQ800, LQ850	24 Pin	Grappler LX	
LQ1000, LQ1050	24 Pin	Grappler LX	
LQ2400, LQ2500	24 Pin	Grappler LX	
LX800, MX 80	9 Pin	Grappler 9 Pin	11
DFX-5000	9 Pin	Grappler 9 Pin	13
DFX-8000	9 Pin	Grappler 9 Pin	13
ELP7000	Laser	GrapplerLX/LS	
Facit			
4509	9 Pin	Grappler 9 Pin	3,11
4510, 4511	9 Pin	Grappler 9 Pin	1
4513, 4514	9 Pin	Grappler 9 Pin	1
B1100, B3100	9 Pin	Grappler 9 Pin	1
B3150	9 Pin	Grappler 9 Pin	1
B3450	24 Pin	Grappler LX	6
C5500	9 Pin	Grappler 9 Pin	1
C6510,C6520	9 Pin	Grappler 9 Pin	1
C7400,C7500	9 Pin	Grappler 9 Pin	1
P7080A	Laser	Grappler LX/LS	9

Printer	Type	Grappler	Notes
Fujitsu			
DL2400	24 Pin	Grappler LX/LS	6
DL2600	24 Pin	None	
DL3000 Series	24 Pin	None	
DL4400	24 Pin	Grappler LX	6
DL5600	24 Pin	None	
DX2100, 2200	9 Pin	Grappler 9 Pin	1
DX2300, 2400	9 Pin	Grappler 9 Pin	1
RX7300	Laser	Grappler LX/LS	9
Genicom			
1025	9 Pin	Grappler 9 Pin	1
5010	Laser	Grappler LX/LS	9
Hewlett Packard			
DeskJet	Inkjet	Grappler LX/LS	9
DeskJet Plus	Inkjet	Grappler LX/LS	9
LaserJet	Laser	None	
LaserJet II, IIP,IID	Laser	Grappler LX/LS	
LaserJet III	Laser	Grappler LX/LS	
PaintJet	Inkjet	None	
ThinkJet	Inkjet	None	
IBM			
ProPrinter	9 Pin	Grappler 9 Pin	
QuietWriter		None	
Kyocera			
F-1000A, F-1010	Laser	Grappler LX/LS	9
F-2010, F-3010	Laser	Grappler LX/LS	9
Laser Computer			
190E,190A	9 Pin	Grappler 9 Pin	1
Mannesman Tally			
MT85, M86	9 Pin	Grappler 9 Pin	1
MT87, M88	9 Pin	Grappler 9 Pin	1
MT165	9 Pin	None	
MT290, M460	9 Pin	Grappler 9 Pin	1
MT330	24 Pin	Grappler LX	6
MT910	Laser	Grappler LX/LS	9
MT-SP80	9 Pin	Grappler 9 Pin	
Nissho			
NP2410	24 Pin	Grappler LX	6
NEC			
LC860	Laser	Grappler LX	9
P5XL, P6, P7	24 Pin	Grappler LX	6
P9XL, P2200	24 Pin	Grappler LX	6
P5200, P5300	24 Pin	Grappler LX	6
PC8023-A	9 Pin	Grappler 9 Pin	
Okidata			
80, 90 Series	9 Pin	None	
2410 Series	9 Pin	None	
KXP-1080 Series	9 Pin	Grappler 9 Pin	
KXP-1090 Series	9 Pin	Grappler 9 Pin	
LaserLine 6	Laser	None	
ML-180	9 Pin	None	
ML-192,192+	9 Pin	Grappler 9 Pin	
ML-193+	9 Pin	Grappler 9 Pin	
ML-292, 293	9 Pin	Grappler 9 Pin	
ML-393+	24 Pin	Grappler LX	6
400 & 800	Laser	Grappler LX/LS	
240	24 Pin	Grappler LX	
Olivetti Office USA			
DM 1005	9 Pin	Grappler 9 Pin	1
Olympia			
LaserStar6	Laser	Grappler LX/LS	9
NP30	9 Pin	None	1
NP80S	9 Pin	Grappler 9 Pin	1
NP136S	9 Pin	Grappler 9 Pin	1
PCPI			
Laning 1000	Laser	Grappler LX/LS	9
2000, 3000	Laser	Grappler LX/LS	9
Panasonic			
1080i, 1091i	9 Pin	Grappler 9 Pin	3,11
1081, 1081i	9 Pin	Grappler 9 Pin	
1090	9 Pin	Grappler 9 Pin	4,11
1092i	9 Pin	Grappler 9 Pin	1
1124, 1524	24 Pin	Grappler LX	6,11,13
1592, 1595, 1695	9 Pin	Grappler 9 Pin	1
4420	Laser	Grappler LX/LS	9
4450, 4455	Laser	Grappler LX/LS	9

Printer	Type	Grappler	Notes
Printek			
930/dl+	9 Pin	Grappler 9 Pin	1
2000TX,2000CX	9 Pin	Grappler 9 Pin	1
Ricoh			
PC6000	Laser	Grappler LX/LS	
Seikosha			
BP-5420	9 Pin	Grappler 9 Pin	1
MP-1300AI	9 Pin	None	
SK-3000AI	9 Pin	Grappler 9 Pin	1
SK-3005AI	9 Pin	Grappler 9 Pin	1
SK-3500+	9 Pin	Grappler 9 Pin	1
SL-80AI, 130AI	24 Pin	Grappler LX	6
SP-180, 185AI	9 Pin	Grappler 9 Pin	1
SP-1200	9 Pin	Grappler 9 Pin	1
SP-2000+	9 Pin	Grappler 9 Pin	1
SP-1000AP	9 Pin	Grappler 9 Pin	1
Sharp			
JX-720		None	
JX-9300	Laser	Grappler LX/LS	9
Star Micronics			
Gemini 10X	9 Pin	Grappler 9 Pin	
NB-15	24 Pin	Grappler LX	6
NB25-10	24 Pin	Grappler LX	6
NB24-10, 24-15	24 Pin	Grappler LX	6
NP-10	9 Pin	Grappler 9 Pin	
NX-15	9 Pin	Grappler 9 Pin	
NX-10, 100	9 Pin	Grappler 9 Pin	1
NX-1000, 1020	9 Pin	Grappler 9 Pin	1
NX2400	24 Pin	Grappler LX	6
SD10,	9 Pin	Grappler 9 Pin	
SG & SR	9 Pin	Grappler 9 Pin	
Toshiba			
P321	24 Pin	Grappler LX	12,13
P321SL	24 Pin	Grappler LX	13
P351C, P351SX	24 Pin	Grappler LX	13
PgLsr 12	Laser	Grappler LX/LS	9

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Key to Notes:
1. Epson EX, FX, JX series emulation
2. Epson LX series emulation
3. Epson RX series emulation
4. Epson MX series emulation
5. IBM ProPrinter emulation
6. Epson LQ series emulation
7. Plug in cards emulate LQ 1000.
8. Toshiba P351 emulation
9. HP LaserJet Plus emulation
10. HP compatibility option required
11. No reverse line feed
12. Parallel extension needed
13. Slow printing / not recommended

NOTICE:
This chart represents the best current information, based on testing and data supplied by the printer manufacturers. Printers listed as compatible may still exhibit variations in multiple page alignment, slower print speeds and other minor limitations. Laser printers require a minimum of 1MB of printer RAM.

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software from PLI and Pacific Micro or hardware from Central Point. You can even get a Mac-on-a-board from Hydra Systems for full Macintosh emulation on your PC (for the same price as a Mac Classic).

Myth No. 6: You can't get here from there, part II.

Ignorance is bliss — unless it means you're losing out on Macintoshes for no reason. Many MIS managers believe that Macs don't easily fit into mainframe-based networks. What we're dealing with here is lousy marketing, not missing capabilities. Apple has been remiss in failing to educate network managers about the options available to them — such as minicomputer- and mainframe-database access that makes the Mac the ideal universal client on practically any network. And new products are arriving daily to simplify the process. For example, a software package called, simply, Both bundles an easy-to-use IBM-mainframe-interface builder with on-site developer training from its creator, Connectivité.

Myth No. 7: We can't buy Mac computers through our standard computer-requisition channels.

The channels are changing for everyone; there *are* no standard channels anymore. And one consequence of the recent Apple/IBM alliance is that Apple will get access to the IBM enterprisewide sales force. That's about as standard as sources get these days.

Myth No. 8: No clones means no second source.

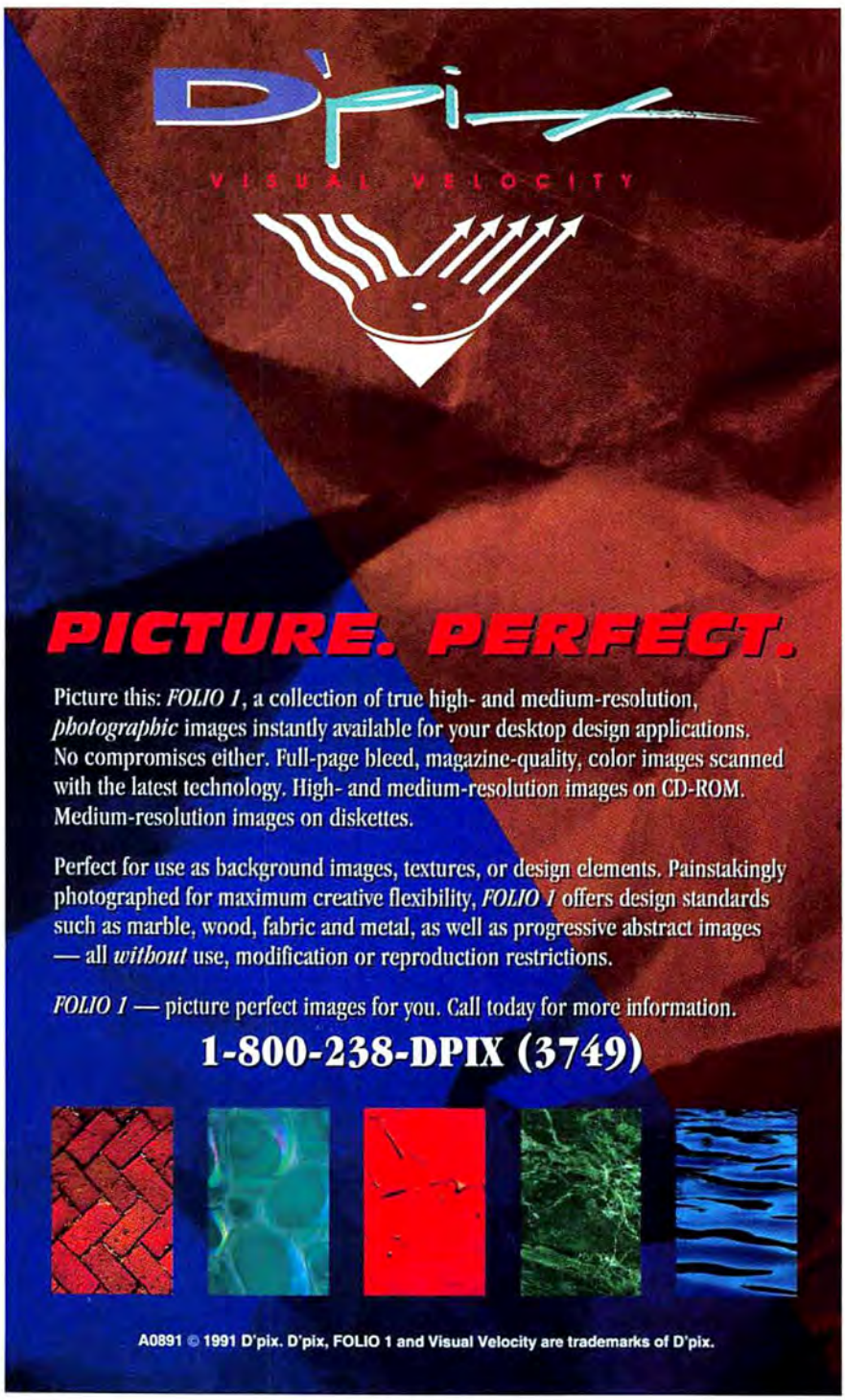
How about IBM? In light of the technology alliance, IBM has become, if not a source, a powerful guarantor of continued support for the Mac. As the Mac has become a secure standard in the computing marketplace, second-sourcing has ceased to become a serious issue. And when the new "Pink" RISC-based operating system jointly developed by IBM and Apple comes on-line in the next couple of years, Apple, IBM, and all other licensees of the OS will effectively become each others' second sources.

Myth No. 9: What's the big deal about windows and icons, anyway?

Not much. The hoopla surrounding the superficial cosmetic attributes of Windows 3 led many Mac-illiterates to believe that that was all the Mac was about — icons, scroll bars, and pull-down menus — and that you no longer needed a Mac for any of those tricks.

Which is like saying that Mozart and Madonna are roughly comparable: They exploit the same musical building blocks to achieve essentially the same outcome, so who needs Mozart? What Windows — and Madonna, for that matter — lacks is a rock-solid foundation and heritage to build on. The real advantages of the Macintosh lie behind the pretty pictures. For example:

•The Mac OS was written specifically for the Mac hardware, which is optimized for a graphical interface.



CIRCLE 68 ON READER SERVICE CARD.

•Third-party Mac developers have standard-interface guidelines to follow to ensure that users don't have to start from scratch and relearn how to load and use software or how to install hardware every time they get something new.

•Networking is built in to the system software and the hardware; you don't have to call a consultant when all you want to do is hook up a printer or transfer files.

The Mac advantage over other platforms is as much a political one as a technological one: The Mac operating system provides users with a constitution with which all applications generally abide, while Apple's interface guidelines assure Mac users of a fundamental bill of rights of what to expect and demand from their computers. On other platforms, they haven't even decided what form of government to have.

Myth No. 10. No good games.

Aha! The real objection emerges. True, Apple's idea of entertainment is a Friday-afternoon beer bash to celebrate — or mourn — the latest corporate reorg.

But a new crop of games has utterly shattered the myth that the Mac comes up short on entertainment value. For sheer elegance, you can't beat Accolade's Ishido. For cognitive thrills, Inline Design's 3 in Three and Cyan's Cosmic Osmo and Spelunx are unsurpassed. And for raw nail-biting chills, Velocity Development's Spectre offers fast-paced networkable game play and absolutely stunning real-time 3-D graphics that are unequaled this side of a Cray.

This chain has been circling around the world since 1984. In 1990, Andy Ihnatko kept the chain going and got a job cowriting MacUser's *Help Folder. Years earlier, Andy Rooney had his chance and blew it. Shortly thereafter, he was forced to publicly humiliate himself by whining coast to coast every Sunday evening.*

Keep the chain going, and you'll have good luck. Good luck.

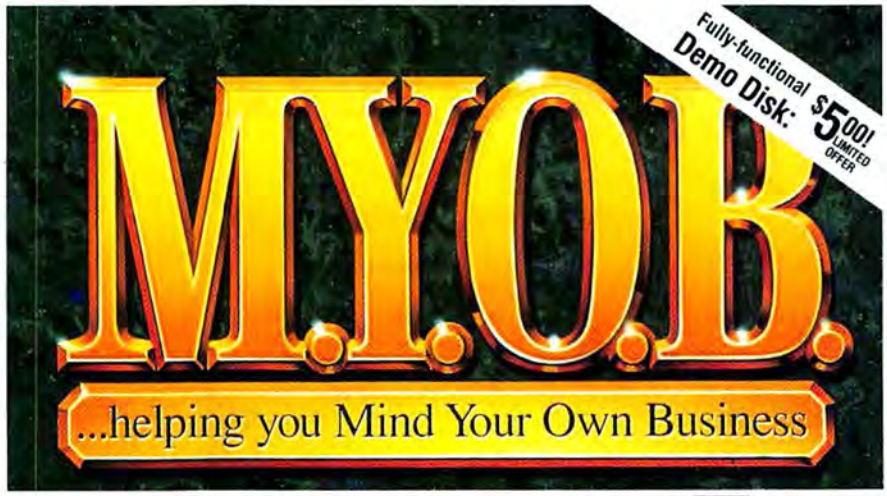
III. Convert the Infidels

The third strategy is the hardest — but it's the most effective in the long run. Get the bureaucrats to see — and envy — what they've been missing. You have to be subtle, though. Make your next request for equipment a Macintosh-based multimedia extravaganza — a little animation, a few scans, a dollop of sound — and then casually drop a few hints around the office about how quickly and easily you put the whole thing together.

Once They've decided they want to become one of Us, you'll have Them coming to You to ask what to get you next.

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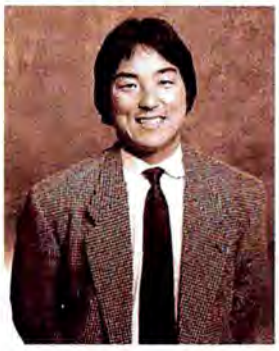


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E-Mail Etiquette



Computers were supposed to make us more powerful, not more rude. Maybe it's time to Emily Post our E-mail.

This is a thread of public E-mail messages recently posted on CompuServe. It concerns the quality of Jean-Louis Gassée's column in *MacWEEK* and mine here. It inspired me to write about E-mail etiquette.

```
From: Barry House
To: Tim Fredenburg
I'm with you. Gassee appears to
be trying to be a "devil's
advocate" who offers a wildly
different viewpoint.
Unfortunately, he often succeeds
only in presenting a half-formed
idea with a conclusion that is
seldom supported by the bulk of
his text.
Instead of Mac celebrities like
Gassee in MacWEEK and Kawasaki in
MacUser, I'd rather read someone
who has something genuine to say
and writes well in saying it.
From: Guy Kawasaki
To: Barry House
Are you saying that (a) I have
nothing to say or (b) that I
don't write well or both? I doubt
that the MacUser people will see
this comment here in the MacWEEK
area. You should contact Jim
Bradbury (72511,41) directly to
complain about me.
From: Barry House
To: Guy Kawasaki
Actually, I'm saying both. On the
other hand, you ARE Guy Kawasaki,
so mediocre copy with your byline
is more marketable than mediocre
copy with my byline. I have the
same problem with Monsieur
Gassee; I can't think of a column
he's written for MacWEEK—or
you've written for MacUser—that
would have been accepted if it
had been submitted by me or some
other unknown freelancer.
```

Here is the "Guy Kawasaki Guide to E-mail Etiquette."

In Your Face

1. Ask yourself, "Would I say this to the person's face?" before you post a public message. I don't know Barry personally, and I feel that meeting him would be right above being Iraq's representative to the United Nations, but I suspect that he's an average Joe like any of us. Electronic mail, however, turns average Joes and Janes into swaggering John Wayne-Steven Seagal-Chuck Norris-Charles Bronson-mutant-ninja-electronic assassins.

Ask yourself this question, and keep editing until the answer is yes. Then your message may accomplish something. Otherwise, your message will probably be ignored, because most people know that E-mail turns normal folks into raging savages. In my case, I don't ignore these messages: I take great joy in them and go so far as to reprint them in a column so that 375,000 people can read them too.

2. Give your E-mail recipients cues about what you really mean. In person-to-person communication, you provide many cues such as your facial expression, voice tone and volume, and body stance. Imagine the difference between reading a message that says `You're a lousy writer` and a face-to-face conversation in which a person says the same thing and then smiles. It's possible to communicate these cues on E-mail through the use of E-mail symbols and abbreviations.

Here are a few from Ken Schoenberg and the rest of the gang from America Online and from *The Unofficial Smilie Dictionary*, sent to me by someone from Internet:

:) = Smile
;) = Wink
:(= Frown
:-(O) = Yelling
$-) = Just won the lottery
=:-) = Hosehead
:-' = Spitting out tobacco
:D = Laughing
:* = Kiss
: X = Lips are sealed
[:-) = Wearing a Walkman
:P = Sticking out tongue
[] = Hug
LOL = Laughing Out Loud
OTF = On The Floor (Laughing)
ROTFL = Rolling On The Floor Laughing
\\/_ = Vulcan greeting

When you get good at using these symbols, you can be rude without being rude. For example, `If you think my writing stinks, you should smell your breath sometime. :)`

3. When you send mail, think of the easiest way for your recipient to respond. For example, if you're on AppleLink and your recipient is on AppleLink, send your message through AppleLink. Some people send mail via Internet (a worldwide network that links E-mail systems) to an AppleLink

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recipient even though they have an AppleLink account, because Internet is free. The problem is that when the recipient responds, he has to type an address like `Joe_Blow@tuck.edu@internet#`.

If you want an answer, make it easy for the recipient — not cheaper for you. I often incorrectly address Internet responses, and by the time I get the message back, I've thrown away the original message. Also, I'm not all that sure how Internet works; I think that Clifford Stoll runs Internet from his house and forwards all the messages in his spare time.

4. Never send a file when a message will do. When you send a file, you're saying to the recipient, "You have lots of time to waste. I want you to download the file. Remember that you downloaded it. Remember where you downloaded it. Remember its name. Decompress it with a utility I assume you have. Open it with an application I assume you have. If you don't have the decompression utility or application, write back to me to ask me to send it another way."

After a guy has downloaded and opened a file, he has the privilege of reading a three-paragraph message in a font he doesn't own. Of course, you could have copied and pasted this file into a message with three clicks of a mouse. Is there any legitimate reason to send a file? Yes: when many people are *working* with the file. For example, a file should be sent between a writer and an editor or between a desktop publisher and a Lino parlor.

5. If you have to send a file (although I can't see why you have to, other than the reason I just mentioned), put your E-mail address into the file. Many people send files that don't contain their E-mail address, so the recipient has to go back on-line and search for the sender's address. This is the '90s equivalent of mailing a letter without a return address on the (dumb) assumption that the envelope stays with the letter.

6. Keep it short. E-mail should save time, not waste it. Rule of Thumb No. 1: No message should be longer than 100 words. Rule of Thumb No. 2: A response should be a fifth as long as the inquiry (for example, 100-word inquiry, 20-word response).

E-mail is GIGO: Get in, get out. Ask your question, get your answer. E-mail flattens out corporate and sociological hierarchies. You can write to John Sculley, John Akers, or the Dalai Lama without going through assistants. They respond. It's as simple as that. Nobody cares who you are. Everybody cares about wasting time.

7. Ignore stylistic and grammatical considerations. Using E-mail saves time because careful editing and proofing is not necessary or appropriate. E-mail is supposed to be fast, tit-for-tat communication. You ask. I answer. You ask. I answer. You're not supposed to watch the sun set, listen to the surf pound the sun-bleached sand, and sip San Miguel beer as Paco dives for abalone while you craft your E-mail.

Between Me and You

8. Never use receipts and carbon copies. Receipts are messages the E-mail system generates to inform the sender that the recipient has read the mail. You know what carbon copies are. Receipts are insulting. You are saying to the recipient: "You're a lazy schlub who never reads his E-mail. I receipted this message so that I know you read it. Now you have no excuse not to answer, because I know you received the message."

Carbon copies are stupid. For example, I often get carbon copies of messages sent to John Sculley complaining about Apple. People who send these think that John is going to see that I'm carbon-copied and be scared feceless that I'll write about the matter in *MacUser*. Or that by bringing the matter to my attention, I'll be so overwhelmed with concern that I'll intercede and call John to help resolve the problem.

Dream on: John couldn't care less that I've been carbon-copied — assuming that he even notices it — assuming that he reads the message. Dream on: When I get carbon-copied, I usually throw the message away. (E-mail etiquette stipulates that if it ain't addressed to you, you ain't got to do anything about it). I have enough problems being a wife without getting involved in other people's problems.

A Declaration

This column has been cathartic. It is also a declaration: Ninty-five percent of the people who send me electronic mail will probably read this, so from this point on, if you send me a file, you will not get a response. If you receive files from people, send them a photocopy of this column. If this is too much trouble, contact me, and *I'll* send you a file of this column to send to them. ;)

Let me know if you'd like a copy of *The Unofficial Smilie Dictionary*, and I'll send it to you — also as a file.



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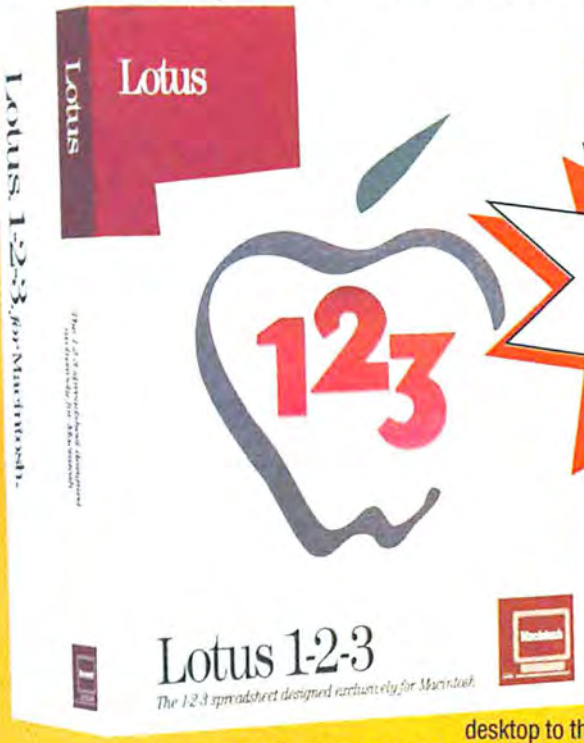


Tsunami drives come initialized with SilverLining, the standard of hard disk utility software, and SilverPlatter. Apple's system, five megabytes of public domain software and Norton Utilities are also included on the drive. LaCie features a warranty of 5 years on the Tsunami drive. #03949

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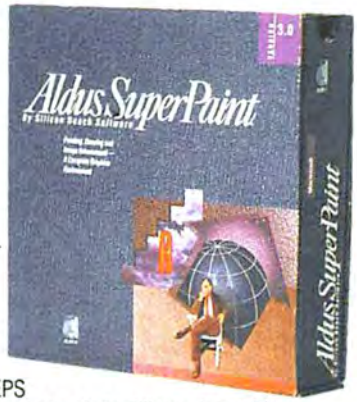
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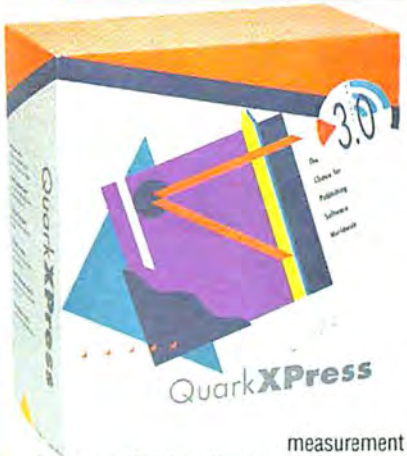
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Aldus SuperPaint 3.0 combines painting, drawing and image enhancement in one powerful, easy-to-use graphics program. New features include: 1 through 24-bit color, textures, gradients, masking, hot keys, brightness and contrast, color balancing, direct scanner support and support for importing EPS graphics. SuperPaint 3.0 provides access to 16.7 million colors without requiring a 24-bit color board. It's the ideal tool for anything from the simplest business illustrations to sophisticated full-color art. #04190

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XPress 3.0 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive on-screen access. A library stores frequently-used items and a pasteboard provides work area next to each page. You can group text and graphics as single elements and rotate them a full 360° in 0.001 degree increments. Color trapping ensures precise color printing. #03488



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NetModem/E is a stand-alone Ethernet communications device designed to meet three LAN communications needs. It allows remote workstations to dial in with full access to network services, lets LAN workstations call out to remote information services or hosts, and joins geographically separated networks in a routing connection over ordinary phone lines. #04129

Shiva
Shiva Hublet
$299



The Shiva Hublet is a stand-alone local concentrator for 10BaseT networks allowing multiple nodes to connect to a single network drop. Its four ports provide connection to Macs and PCs, workstations or any 10BaseT device–making it the "power strip for 10BaseT." #04156



Sigma Designs
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DoubleUp is the first real-time lossless file compression card for the Macintosh NuBus family. With it you can more than double your hard disk's effective storage capacity. Data, images and applications can be compressed and decompressed at virtually unnoticeable speeds. It ensures your data is never lost or altered. bundled with DiskDoubler. #04220

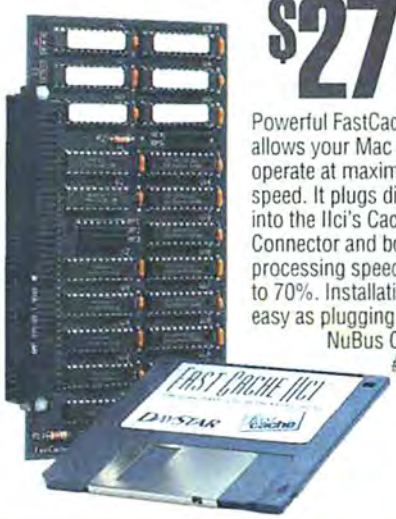


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Asante's family of Ethernet solutions gives you all the right connections. MacCon network interface cards plug into your Mac to deliver high-performance connectivity that's reliable and cost effective. You get full compatibility with EtherTalk allowing MacCon cards to serve in a wide variety of hardware and software environments. #00510

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Farallon
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Adobe Illustrator

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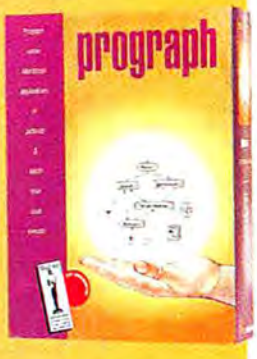
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Save the hassle of creating your own artwork from scratch. This new Cliptures volume gives you 240 exquisitely detailed illustrations of the national and civil flags from all the countries of the world, plus various international organization and code flags. These beautiful illustrations are ready-to-use, and they work with any software program that accepts EPS (Encapsulated PostScript) files. #04282

TGS Systems Prograph 2.5

$299



Prograph's powerful Visual Programming Environment is the fast and fun way to program the Mac. Construct stand alone applications without typing code, create user interfaces as fast as you can draw them! The new database engine lets you create multi-user, multiple table database applications that support multiple indices and arbitrary data types. #04253

Adobe Type-On-Call



$54



Type On Call offers over 800 Adobe Type 1 fonts on a single CD-ROM in a new accessible format. Simply by purchasing access codes over the phone, type users can obtain new fonts from the disk. Type On Call is the quickest and easiest way to buy fonts – once you have the disc, every font is a simple phone call away! #03950

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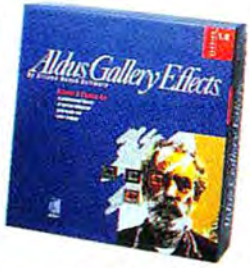
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MICHAEL SWAINE

Look Who's Talking



Applications talking to each other via IAC sounds like a good idea, but Apple may have forgotten something: Who's talking to the applications?

Dave Winer's latest software brainchild is the only product in its category. The competition is brutal.

The basic idea behind Userland Frontier was made to order. Order, demand, sometimes even polite request. Mac users have wanted something like this since 1984, whether they called it user scripting, batch files, macros, or command-line programming.

Here's the idea:

Say you have a sequence of operations that you run through again and again. You update numbers in one spreadsheet, paste the totals into a boilerplate interoffice-memo form, and E-mail the memo to another department. Or you compile all files in a folder and run a program. Or you delete all temporary files, back up all data files, and shut down.

What you need is the ability to specify all these steps and then go to lunch while they happen. And you need the ability to reinvoke this sequence later without having to specify all the steps all over again.

Programs such as QuicKeys let you do this at one level, but there is potentially more power in a script-oriented approach, in which you specify what you want done by using a scripting language. And ideally the scripting language should be able to drive the operating system, so you can delete files and such, as well as drive all your favorite applications.

That's the idea behind Frontier.

Some version or another of this idea is what made Lotus 1-2-3 the best-selling software product ever and kept the UNIX and DOS operating systems alive all these years. Userland Frontier finally puts the idea to work on the Mac, showing a Mac-like interface and employing the latest system-software gimmicks: IAC (interapplication communication) and Apple events. Sound good? Ah, but before Userland can sell Frontier to users, it has to sell it to developers, because your favorite applications have to become Frontier-friendly. There's the rub.

For Winer, the road to Frontier began in college with writing UNIX batch commands, took a detour through entrepreneurship in the form of a company named Living Videotext, and led eventually to a series of breakfast meetings with Jean-Louis Gassée in 1988. Knowing that Gassée had been talking up AppleScript, Apple's much-rumored systemwide user scripting language, Winer pumped him for the status of AppleScript development, saying that he was considering creating products for it. The answer left Winer thinking that there might indeed be an opportunity here for a third-party developer: There really was no development, and there was no Apple scripting language.

Three years later, there's still no AppleScript but there is a Userland Frontier. In its primary mode, Frontier lets you pop up a narrow window and type a one-line command into it. There are hundreds of these commands, and yes, it's a programming language, and no, that doesn't mean that Frontier is a hacker's tool—unless people who write DOS batch files, spreadsheet macros, or SQL queries are hackers. There are programming languages and programming languages, and Frontier's is one of the easy ones.

More-complicated scripts can be spun off, optionally, as double-clickable files and shared or downloaded much like HyperCard stacks (but smaller).

A fine idea, perhaps, but it's a system-software idea, and Macintosh system software is an area about which Apple Computer has proprietary feelings. True, there is no AppleScript in sight and Apple is overtly supportive of Frontier, but what might be going on out of sight is the source of some fear, uncertainty, and doubt among Winer's developer customers. Frontier developers are hearing hints from Apple about AppleScript. Winer thinks Apple is a long way from releasing a product, but he can't prove it, and uncertainty is just what he doesn't need while trying to convince developers to make their products support Frontier.

Frontier already has competition. HyperCard and QuicKeys are both being touted as control panels for application functionality, although HyperCard's development-environment baggage would probably argue against its casual use for writing the occasional script and QuicKeys operates at a different level from Frontier. Frontier appears to offer advantages that HyperCard and QuicKeys can't touch, but these are established products with good support networks and defensible claims on some part of the IAC pie.

Frontier also faces competition from a fundamentally different IAC model, that of program-to-program communication. In this model, two vendors may agree to create ways for their applications to work together, with application A adding a menu item that gives the user access to certain capabilities of application B.

At one end, this kind of cooperation is



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CIRCLE 167 ON READER SERVICE CARD.

We often speak of a program 'doing this' or 'doing that.' These words are just shorthand for talking about what people can do with the programs.

relatively simple. Any company can open up the functionality of its application to general Apple events or define and publish specifications for its own application-specific Apple events. The company's application can then be driven by any other application that sends it the appropriate Apple-event message. This opening-up process is called installing the IAC wires.

At the other end, the program sending the message needs some reason to do so, and the best reason is that the user wanted it done. This situation is more complicated, because it requires some sort of user interface—at least a menu item—and because it requires deeper cooperation among vendors to make it work.

In the Frontier model, vendors have to install only the IAC wires. It is the user, through Frontier, who drives the application. If you believe Winer, the choice of models is a simple matter of who is to be in charge: individual users or software companies.

"I don't believe in applications talking to each other," he says. "I believe that the user is the orchestra leader. He talks to one application, asks for something, and then passes that off to the other application. I don't think it's a trivial difference. A lot of people are trying to . . . get all these conversations going between applications, and it's an exercise in frustration. It calls for a consensus amongst competitors that . . . is a very unlikely thing, and it removes forever, if we have that kind of consensus, any possibility of competitiveness on the basis of how good your [IAC] wires are. It won't work that way."

Hmm.

ACIUS' 4th Dimension now works with GeoQuery through just the sort of program-to-program communication that Winer opposes. A 4D user can select data and choose a new menu item to launch GeoQuery; transfer the 4D data to it; and jump to GeoQuery, displaying the data graphically in one of a variety of ways.

So Winer is wrong on one count. It *will* happen, because it *is* happening. Still, I think that there's something in what he says. We in the computer press and the software industry often speak of a program "doing this" or "doing that." It's easy to forget that these words are just a convenient shorthand for talking about what people can do with the programs. It may be that in the case of interapplication communication, we have taken our shorthand literally, thinking of IAC as something that programs do rather than as a facility that lets people do something with programs.

Which leads me to the following question: Why did Dave Winer name his product Frontier?

Here's my theory: The concept of the frontier in American culture has something to do with the true importance of the individual. On the frontier, you make your choices in the light of nature, not of some abstraction such as law or government, and you live with the consequences without appeal. On the frontier, you say "somebody" rather than "someone," because the only ones who count are the ones with bodies.

I suggest that the frontier mentality is a recognition of a simple truth that is often obscured by the artifices of civilization: that governments, corporations, and the other bodiless ones are collective fictions and that there's really nothing here but us somebodies.

It's vastly more convenient, if you aren't living on the literal frontier, to use the shorthand; it's easier to speak of a government or corporation or program doing something than to describe what's really going on. But it's always possible to do the latter.

When a company (say Userland) announces a release date (say October 1991) for a product (say Frontier), what's really happening is that Alice has touched up and Judi has sent out copies of a press release that was drafted by Dave, based on promises to Dave from Doug. The situation is more complicated in a company that has more than six employees, naturally. But it's always somebody.

So when it comes to IAC, I incline toward the Frontier mentality.

A while back, some people at Apple Computer adopted a slogan for their collective efforts: "The individual is at the center of everything we do." I hope those people are still at Apple. The individual is at the center of everything we all do, but sometimes we forget.

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2997 PictureBook Plus *(Sept. '91)* 75.

★Magic Software ... 30 day MBG
7267 ❼AutoSave II 2.0 26.
7270 ❼Backmatic 2.0 50.

★Microcom ... 30 day MBG
8562 ❼Complete Undelete 1.1 48.
4803 ❼Virex 3.5 57.
8561 ❼911 Utilities 1.0 89.
2462 ❼Citadel with Shredder 89.

MicroMat Computer Systems
2810 MacEKG 1.0.9 63.

★Microseeds Pub. ... 60 day MBG
7068 ❼INITPicker 2.02 34.
2913 ❼Redux 1.63 49. 7116 ❼Rival 1.1.6 49.
2936 ❼HAM 1.0 49.



Microseeds Pub. ... 30 day MBG
2936 ❼ *HAM 1.0*–HAM, the Apple menu manager, gives you hierarchical sub-menus and access to recently used items, lets you re-order the Apple menu, and automatically restarts to files open at shutdown $49.

★Microsoft ... 30 day MBG
4471 QuickBasic 1.0 64.

★Nine to Five Software ... 30 day MBG
9767 ❼Reports 2.1 94.

★Now Software ... 30 day MBG
6925 ❼Now Utilities 3.0 84.

★ON Technology ... 1 year MBG
6385 ❼On Location 1.02 75.
9801 ❼Meeting Maker *(5)* 309. 9800 *(10)* 549.
2570 ❼Instant Update *(2)* 309. 2571 *(5)* 619.

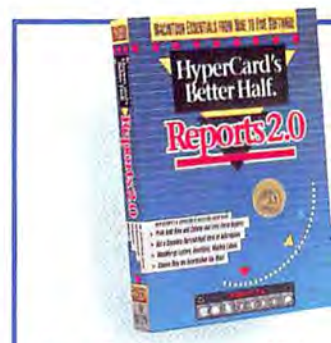
★Palomar Software ... 30 day MBG
8210 ❼PLOTTERgeist 2.0 249.

★Salient Software ... 30 day MBG
7404 ❼DiskDoubler 3.7 49.

★Softstream ... 30 day MBG
5440 ❼HyperHit 3.0 119. 1568 *(network)* 389.

★Solutions, Inc. ... 60 day MBG
3448 ❼SmartScrap & The Clipper 2.1 . . . 56.

★SuperMac Tech. ... 60 day MBG
3377 ❼DiskFit 2.0 58.



Nine to Five Software ... 30 day MBG
9767 ❼ *Reports 2.1*–Completes HyperCard and turns it into the most affordable, powerful information management system on a Mac. Design & print any kind of report: mail merge, labels, statements, etc. 4½ Mice *MacUser*, 6/91 . . $94.

★Symantec ... 30 day MBG
5176 ❼Symantec AntiVirus for Mac *(SAM)* 66.
5724 ❼Symantec Utilities for Mac *(SUM II)* 96.
6748 ❼Norton Utilities for the Mac 1.1 . . . 87.
3421 ❼THINK Pascal 4.0 165.
2688 ❼THINK C 5.0 165.
9957 ❼THINK Reference 1.0 69.

★Synex ... 30 day MBG
7147 ❼MacEnvelope 5.1 57.

★Tactic Software ... 30 day MBG
8964 ❼MasterFinder 1.2 49.

★Teletypesetting ... 30 day MBG
8058 TScript 3.0 91.
3014 ❼TScript Deluxe 315.

★TGS Systems ... 60 day MBG
6667 ❼Prograph 2.5 *(Sept. '91)* 309.

★Wolfram Research ... 30 day MBG
8273 ❼Mathematica Enhanced 2.0 . . . 799.



Salient Software ... 30 day MBG
7404 ❼ *DiskDoubler 3.7*–Because no disk is big enough, this latest System 7 Savvy version provides smaller compressed files, increased speed, simplified file backups, & self-expanding files. *Macworld* 1991 World Class Award winner . $49.

340U

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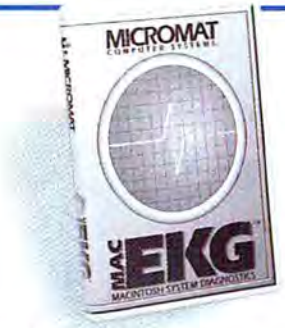
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Adobe Systems
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9443 Adobe TOC & Porta Drive Bundle . 659.
CD Technology
2321 CD-ROM Caddy . . 11. 2533 *(5)* . . 49.
8057 Porta Drive CD-ROM 599.
7686 Porta Drive & ❼MS Office CD-ROM 999.
★Cyan ... 30 day MBG
2717 ❼Cosmic Osmo 1.1 *(CD-ROM)* . . . 37.
★Discovery Systems ... 60 day MBG
9967 Nautilus *(subscription kit, CD-ROM)* 20.
9968 Birds of North America *(CD-ROM)* . . 26.
9965 Sherlock Holmes on Disc *(CD-ROM)* 26.
9966 Shakespeare on Disc *(CD-ROM)* . . . 26.
1874 Mammals of N. America *(CD-ROM)* 52.
2484 The Family Doctor *(CD-ROM)* 125.
Dubl-Click
9944 The WetSet CD *(CD-ROM)* 218.
★Everex ... 30 day MBG
1875 Metro CD CD-ROM Drive 479.



MicroMat Computer Systems
2810 *MacEKG 1.0.9*–Detect software and hardware problems BEFORE they occur. This new diagnostic measures every performance indicator giving you a virtual "dashboard" for your Mac. Digital voice announces test results $63.

★Highlighted Data ... 30 day MBG
7771 ❼Webster's Dictionary *(CD-ROM)*. 159.
★HyperGlot ... 30 day MBG
9778 ❼Learn to Speak English, 7473 French, or 7829 Spanish *(CD-ROM)* . . . *ea.* 64.
2615 Lingua ROM II *(3-CD Set)* 649.
★Microsoft ... 30 day MBG
6382 ❼The Microsoft Office *(CD-ROM)* 599.
★Monotype Typography ... 30 day MBG
Classic Font Library on CD-ROM . . call
NEC
6625 Clip-Art 3D *(2500 full-color images)* 246.
6636 Image Gallery *(2800 line art)* 246.
6959 Type Gallery PS *(Adobe fonts)* 246.
9441 CDR36 CD-ROM Portable Drive . . 399.
2595 General Reference CD-ROM Bundle *(inludes CDR36, kit & 3 titles)* 529.
★Penton Overseas ... 30 day MBG
2611 Vocabulearn/ce 2.0 Spanish 1 CD . 69.
2610 Vocabulearn/ce 2.0 French 1 CD . . 69.
★Somak ... 30 day MBG
❼LaserArt I or II *(CD-ROM)* . . . *ea.* 62.
★Tactic Software ... 30 day MBG
2519 Tactic Multi-Media CD 149.



Pixar
1596 *MacRenderMan/ShowPlace Bundle*–Create photographic-quality images with the most advanced rendering software available as you automatically process scenes into full color pictures. A complete picture creation package . . . $649.

Toshiba
6749 XM 3201 CD-ROM Drive. 659.

VIDEO & SOUND

MUSIC, MIDI, ANIMATION

★Ars Nova ... 30 day MBG
1215 ❼Practica Musica 2.2. 66.
★Bogas Productions ... 60 day MBG
9279 Studio Session MIDI Utility 1.0 59.
6135 Super Studio Session w/Music Library 99.
Coda Music Systems
8188 ❼MusicProse 2.1. 299.
5604 ❼Finale 2.6.1. 549.
★Farallon Computing ... 30 day MBG
2199 MacRecorder Sound System 2.0.3 174.
6766 MediaTracks 1.0.1 205.
Full Logic Studios
1163 Mac-Sound *(241 great sound effects)* 79.
★MacroMind ... 30 day MBG
9353 ❼MediaMaker 1.0 489.
6159 ❼MacroMind Accelerator 2.01 . . . 125.
5087 ❼MacroMind Director 3.0 699.
2246 ❼MacroMind Three-D 1.0 1029.



Bright Star Technology
2614 *At Your Service*–Six utilities that talk! Reminder, Health Watch, E-Mail Delivery, System Report, Screen Saver and more. "Personalize" your Mac with Phil and friends today! $30.

Mass Microsystems
2592 QuickImage 24. $579.
★Paracomp ... 30 day MBG
7839 ❼FilmMaker 2.0.1 435.
Passport Designs
8253 ❼TRAX 2.0.1. 57.
3117 ❼Master Tracks PRO 4 4.5 315.
8250 ❼Encore 2.0 379.
3115 ❼MIDI Interface. 79.
PCTV
2244 System 7 Video w/Lon Poole *(VHS)* . . 9.
2245 System 7 Video w/Lon's Book 25.
Pixar
1596 MacRenderMan/ShowPlace Bundle 649.
RasterOps
Full line available. Partial listing.
8526 Video Expander 499.
7469 ColorBoard 264/SE30 639.
7457 Video ColorBoard 364 699.
3224 Expresso Slide Scanner 699.
9784 RasterOps 24SI 649.
8944 RasterOps 24STV 1249.
★Symmetry ... 30 day MBG
8172 ❼Mariah 1.0 93.



Abracadata, Ltd. ... 30 day MBG
9990 ❼*Design Your Own Home-Architecture*–Modify or design the home of your dreams! Includes a library of architectural objects and sample floor plans. Everything you need to create professional drawings or a simple sketch . $63.

★Voyager ... 30 day MBG
9322 ❼Voyager Videostack 2.2. 69.
9328 ❼Voyager CD Audiostack. 69.
9326 ❼Beethoven Sym. No. 9 *(CD-ROM)* 69.
9327 ❼Igor Stravinsky 2.0 *(CD-ROM)* . . . 69.

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FOREIGN LANGUAGES, TRAINING, GAMES

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9995 ❼Instant Decorator 1.1. 29.
9990 ❼Design Your Home - Architecture, 9992 Interiors or 9994 Landscape *ea.* 63.
Libraries available. call
Accolade
1423 Hard Ball II 31.
8220 ❼Jack Nicklaus Golf 34.
★Aldus ... 30 day MBG
3503 Dark Castle or 3502 Beyond DC *ea.* 36.
★Baseline Publishing ... 30 day MBG
7785 ❼Talking Moose. 23.
★Beacon Technology ... 30 day MBG
❼HyperBible 2.03 *(KJ or NI)* . *ea.* 125.

and many a fact



Penton Overseas ... 30 day MBG

❼ *VocabuLearn/ce 2.0 CD-ROM*–Increase your language skills by simultaneously seeing and hearing thousands of frequently spoken foreign words & phrases. Incl. free HyperCard & two audio cassettes (French or Spanish) $69.

Broderbund Software

4314 ❼ Type! 1.0 18.
6516 The Playroom 1.1 *(CP)* 29.
Carmen Sandiego Series *(CP)* . *ea.* 29.
6384 ❼ PlayMaker Football 1.1.1 29.
9804 RoboSport 1.0 35.
8195 ❼ BannerMania 1.0 35.
8266 SimEarth 1.0 40.
4966 SimCity 1.2 *(CP)* 29.
5871 SimCity Supreme 1.2C 47.

★ **Carina Software ... 30 day MBG**

5726 ❼ Voyager 1.2 87.

★ **Casady & Greene ... 60 day MBG**

2268 ❼ Crystal Quest 2.2x, 7495 ❼ Mission Starlight or 7498 ❼ Sky Shadow *ea.* 29.

★ **Centron Software ... 30 day MBG**

2707 ❼ Puzzle Master 26.
8525 ❼ Casino Master *(B&W)* 41. 8524 *(Color)* 45.



Centron Software ... 30 day MBG

2707 ❼ *Puzzle Master*–Incl. 200 Daily/50 Sunday Puzzles from NY Times or create your own $26. *Casino Master*–Incl. BlackJack, Craps, Roulette, Video Poker, Baccarat. Exact simulations. 8525 ❼ *B&W 3.2x* 41. 8524 ❼ *Color 4.1* 45.

Electronic Arts

6716 Pipe Dreams 1.2 $17.
1303 Loom 1.0 29.
8643 Harpoon 1.0 or 1907 ❼ PGA Golf *ea.* 39.

F L/Software Heaven

1555 ❼ OIDS 1.0 25.

★ **Great Wave ... 30 day MBG**

4334 ❼ NumberMaze 26. 8527 *(Color)* 36.
8044 ❼ NM Decimals & Fractions *(Color)* 36.
1517 ❼ ReadingMaze 26. 1513 *(Color)* 36.

★ **HyperGlot Software ... 30 day MBG**

❼ Word Torture 4.0-Beginner to Advanced *(Span., Fren., Germ., Ital. & Rus.)* *ea.* 35.
❼ Pronunciation Tutor - Beginner *(Span., Fren.)* *ea.* 35. *(Germ., Chin.)* 39.
❼ Verb Tutor - Intermediate *(Spanish, French, German)* . . . *ea.* 39.

★ **Inline Design ... 30 day MBG**

1562 ❼ 3 in Three 1.1 31.
8809 ❼ Tesserae or 7622 Darwin's Dilemma 31.
1944 ❼ Swamp Gas 1.0 31.

Interplay Productions

1894 ❼ BattleChess *(3D animation)* 29.
1893 ❼ CheckMate *(infinite play levels)* . . 31.

★ **Learning Company ... 30 day MBG**

2670 ❼ Reader Rabbit 3.0 *(CP) (ages 4-7)* 34.

★ **Leister Productions ... 30 day MBG**

7126 ❼ Reunion 2.0 115.

★ **Microsoft ... 30 day MBG**

2868 Flight Simulator 4.0 *(CP)* 43.

★ **Nordic Software ... 30 day MBG**

8257 ❼ PreSchool Pack - Color 1.0 35.
2716 ❼ Word Search Deluxe 35.

★ **Penton Overseas ... 30 day MBG**

❼ VocabuLearn/ce Levels I & II *(French, Italian, Spanish, German, Russian, Hebrew, & Japanese)*. *ea.* 35.

★ **Personal Training Sys. ... 60 day MBG**

❼ Training for System 7, QuarkXPress, Persuasion, FileMaker II/Pro, PageMaker, Illustrator, FreeHand, Word, HyperCard, Excel, & the Mac *(beg. to adv.)*. *ea.* 50.

Sir-Tech Software

8229 ❼ Bane of the Cosmic Forge 35.

Software Toolworks

4619 ❼ Mavis Beacon Typing 1.3 *(CP)* . . . 32.
1908 ❼ World Atlas or 1910 U.S. Atlas *ea.* 52.

★ **Spectrum Holobyte ... 30 day MBG**

3464 ❼ Tetris 1.3 or 6112 ❼ Welltris 1.1 *ea.* 22.
3017 Wordtris 1.0 or 8180 ❼ Faces 1.0 *ea.* 25.
3459 ❼ Falcon 2.2.1 or 8181 ❼ Vette 1.0 *ea.* 33.

★ **Spinnaker ... 30 day MBG**

2328 Sargon IV 1.03 *(CP) (chess)* 28.

★ **Strategic Studies ... 30 day MBG**

2685 ❼ American Civil War 1 29.

StudyWare

ACT, GMAT, GRE, or SAT Prep . *ea.* 29.
8098 LSAT Prep for the Mac 3.7 35.

★ **Terrace Software ... 30 day MBG**

8192 ❼ Mum's The Word 1.0 *(gardening)* 79.

★ **Toyogo ... 30 day MBG**

1993 ❼ Nemesis Scribbler 5.0 31.
7624 ❼ Nemesis Go Master 5.0 36.
2471 ❼ Nemesis Deluxe Toolkit 5.0 72.



Global Village ... 30 day MBG

TelePort A300–1990 MacUser Editors' Choice Award for *Best Communications Product*. 2400 bps/MNP-5 modem connects via ADB Port. SendFax (9600 baud) optional. 8946 ❼ *Basic* $139. 8945 ❼ *with FAX* $185.

★ **XOR ... 30 day MBG**

6040 MacGolf Classic 1.0 *(CP)* 52.

COMMUNICATIONS

MODEMS, MAIL, NETWORKS

★ **Abaton ... 30 day MBG**

6266 InterFax 24/96 Modem 299.
2724 InterFax 24/96 w/InterShare 349.

Applied Engineering

8362 ❼ QuadraLink *(w/AE Shadow)* . . . 205.

★ **Argosy Software ... 30 day MBG**

7872 ❼ Software Bridge/Mac 2.0.1 99.
2448 ❼ RunPC/Network 279.

★ **Beagle Bros. ... 30 day MBG**

7691 ❼ Flash 1.2 125.



Letraset ... 30 day MBG

4709 ❼ *LetraStudio 2.0*–Take your TrueType, Type 1 & 3 fonts on your screen, turn them into customized display type designs, then import them into a page layout or graphic program. Now incorporates new PANTONE color tool kit. $139.

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About everything



Orange Micro ... 30 day MBG

Orange386–Run PC programs in Macs. The Orange386 coprocessor runs independently in your Mac providing networking capabilities.

2394 *Orange386 (16 MHz)* $1679.
2392 *Orange386 (20 MHz)* 1839.

★CE Software ... 60 day MBG

5174 ❼QuickMail 2.5 *(5)* 249. 5173 *(10)* 375.

★CompuServe ... 60 day MBG

1676 ❼Macintosh Membership Kit 1.03 . 22.
1673 ❼CompuServe Navigator 3.04 49.
1674 ❼Membership Kit/Navigator Bundle 68.

★DataViz ... 60 day MBG

1823 ❼MacLink Plus/PC 5.0 129.
4842 ❼MacLink Plus/Translators 5.0 ... 109.

★Dayna ... 60 day MBG

DaynaPORT E: *(10 Base T)* ea. 209.
DaynaPORT E: SE, SE/30, II, IIsi, LC 229.
DaynaTALK *(5 Pak)* 379. *(10 Pak)* 689.
8719 EtherPrint or 9888 *(10 Base T)* ea. 349.

Dove Computer

6758 DoveFax Desktop 2.0 *(Sept.'91)* 295.
9634 DoveFax+ 2.0 *(Sept. '91)* 359.

★Farallon Computing ... 30 day MBG

9805 ❼Timbuktu 4.0.1 135.
4866 ❼Timbuktu/Remote 2.0.1 135.
9961 PhoneNET Card PC 209.
6273 PhoneNET StarConnector 10-Pack. 129.
4869 PhoneNET Connector 10-Pk *(DIN8)* 198.
2206 PhoneNET StarController 300 899.
6687 PhoneNET StarController-EN 500 1739.

★Freesoft ... 60 day MBG

6115 ❼White Knight 11 85.

★Global Village ... 30 day MBG

8946 ❼TelePort A300 139.
8945 ❼TelePort/FAX 185.

Hayes

2300 ❼Smartcom II 3.2A 84.
8614 Personal Modem 2400 Plus 149.
7391 ULTRA 96 Modem 669.

Insignia Solutions

7557 ❼Access PC 1.1 62.
9726 ❼Entry Level SoftPC 2.5 *(Sept. '91)* 135.
4089 ❼Universal SoftPC 2.5 *(Sept. '91)*. 245.
3229 ❼SoftAT 2.5 *(Sept. '91)* 329.

Intel Corporation

5119 2400EX Modem 179. 6420 (MNP) 229.

★Kennect Tech. ... 30 day MBG

5631 ❼Rapport 1.3.6 195.
5632 Drive 2.4 *(3½")* *(incl. FastBack II)* . 325.

★Microcom ... 30 day MBG

7459 ❼CarbonCopy Mac 2.0 *(single)* ... 59.
1556 ❼CarbonCopy Mac 2.0 *(unlimited)* 179.
8027 MacModem V.32 689.

★Nuvotech ... 60 day MBG

3000 TurboNet ST *(DIN8)* 30. 6751 *(12 Pak)* $279.
6272 NuvoLink SC 389.

★Orange Micro ... 30 day MBG

2394 Orange386 *(16 MHz)* 1679.
2392 Orange386 *(20 MHz)* 1839.

★Practical Peripherals ... 30 day MBG

3102 2400 Baud External Modem ... 179.
8994 2400 V.42 bis Modem 209.
7934 PM9600SA Modem 1.26 469.
9849 SmartPack 9600 529.

★Prometheus ... 30 day MBG

2590 ProModem 2400 Mini Plus 175.
3232 ProModem 24/96 S/R Minifax Plus 269.
8990 ProModem Ultima 689.

PSI Integration, Inc.

3143 COMstation 1 285.
3142 COMstation 2 379.

★Shiva ... 30 day MBG

3444 ❼NetSerial 275.
4347 NetBridge or 4942 ❼TeleBridge .. 409.

Sitka/TOPS

4188 Teleconnector *(DIN8)* 23. 2230 *(10)* 189.
3720 TOPS Flashcard 155.
6264 ❼TOPS Network 3.1 *(Sept. '91)* .. 187.



Berkeley Systems ... 30 day MBG

2198 ❼*More After Dark (M.A.D.)*–25 new displays for After Dark. Featuring Mowin' Man, Tunnel, Crazy Kittens, Art Museum $23.
5737 ❼*After Dark 2.0U*–Stops screen burn-in 28.
2196 ❼*After Dark & M.A.D. Bundle* 42.

★Software Ventures ... 30 day MBG

3455 ❼MicroPhone II 4.0 *(Oct. '91)* 215.

★Synergy ... 30 day MBG

6618 ❼VersaTerm 4.5 90. 6619 PRO 3.5 177.

★Tactic Software ... 30 day MBG

2996 ❼Traffic Controller Personal 65.

★Zoom Telephonics ... 30 day MBG

1168 MX2400R Modem *(w/❼QuickLink II)* 85.
1176 MX2400S Modem *(w/SendFax 9600)* 95.
2310 Send/receive Fax/Modem FX9624 139.
1179 V.42bis Modem *(w/MacPack)* 169.
2311 V.32 Turbo Modem *(w/MacPack)*. . 439.

INPUT/OUTPUT

MONITORS, KEYBOARDS, MICE, PRINTERS & SCANNERS

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7432 ❼Scan 300/GS *(reqs. Scan Kit)* .. 999.
1495 Scan 300/Color *(reqs. install. kit)* . 1149.
1496 Int. Kit for 300/Color w/Photoshop 479.
1537 LaserScript LX 1729.



Applied Engineering

8362 ❼*QuadraLink 1.1.1 (with AE Shadow)*–Network Personal LaserWriters, label printers and more with QuadraLink. QuadraLink adds four serial ports to your Mac. AE Shadow lets you share the ports. Incl. 5-user license.. $205.

★Advanced Gravis ... 30 day MBG

9963 Gravis Mouse Stick 59.
9964 Gravis Super Mouse 84.

American Power

5895 UPS 110SE 209.
6686 UPS 370ci 339.

Applied Engineering

9799 ❼Cache-In 199.

Caere

8124 ❼Typist 1.1 479.
4476 ❼OmniPage 3.0 495.

CoStar Corp.

1884 LabelWriter II *(Sept. '91)* 193.
1418 AddressWriter *(Sept. '91)* 499.
1885 ❼Stingray ADB *(Sept. '91)* 89.
2804 ❼Stingray *(stealth black, (Sept. '91)* 89.

★Datadesk ... 30 day MBG

9830 MAC101E Keyboard 129.
2384 MAC101E Kybrd. with QuicKeys^2 . 149.
6901 Switchboard *(modular keyboard)* . 159.

★Everex ... 30 day MBG

1144 ❼Silhouette Trackball 82.

GDT Softworks

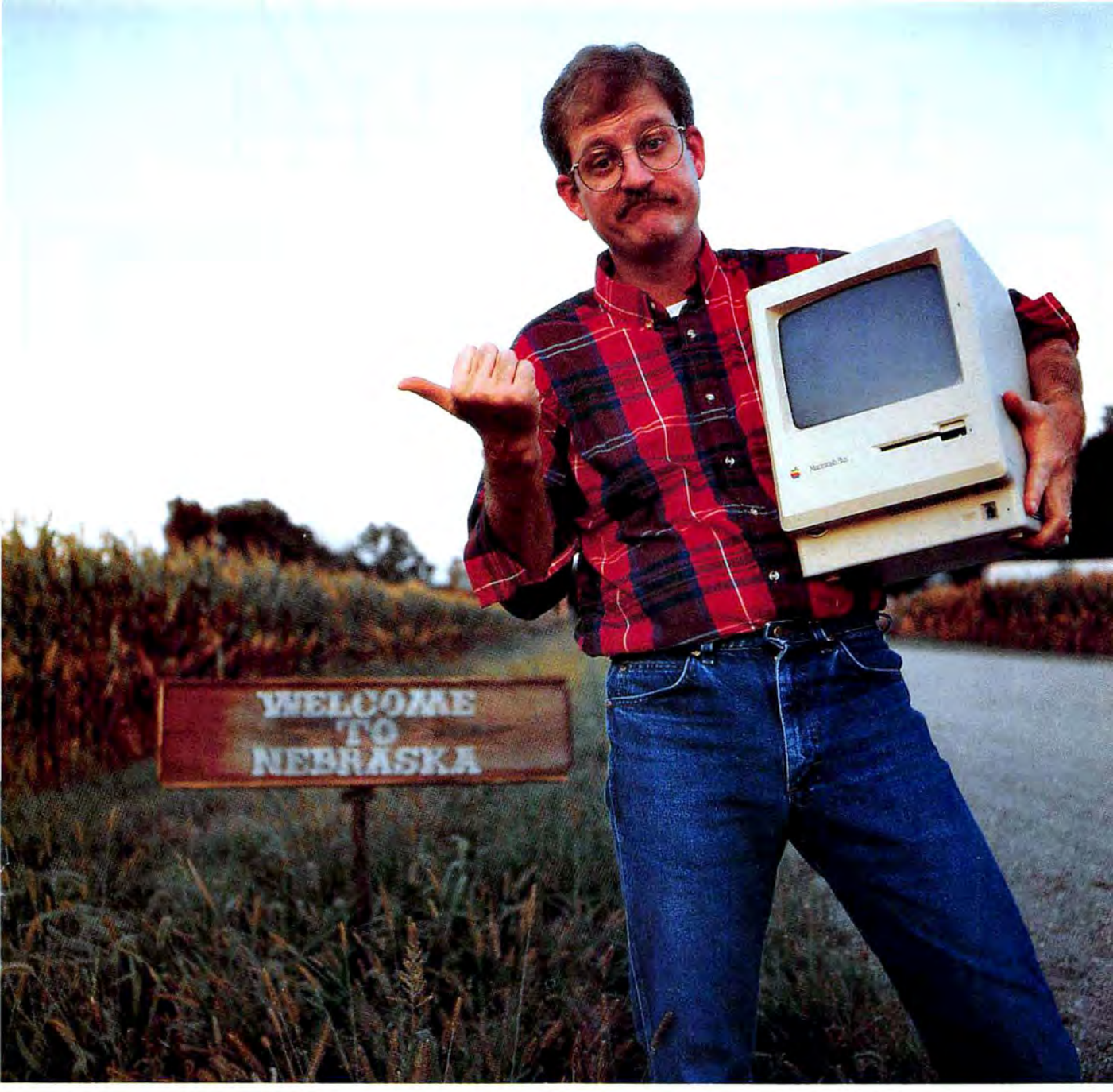
6256 ❼PrintLink Collection 4.01 59.
6151 ❼JetLink Express 2.1 89.



Microcom ... 30 day MBG

Complete disk and file recovery and protection.

8561 ❼*911 Utilities 1.0 (includes all below)* .. $89.
4803 ❼*Virex 3.5* 57.
2462 ❼*Citadel with Shredder* 89.
8562 ❼*Complete Undelete 1.1* 48.



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You've gone above and beyond! I spent two days making numerous phone calls to computer stores to find some technical advice. I needed software to do certain organizational tasks, but had no clue as to where to begin to look. No one around here was any help. Your ad listed "unlimited toll-free technical support." I figured I'd give it a shot. Your sales staff listened to my confusing request, made sense out of it, and found the software I needed. They even gave me another 800 number to call for even more information. It was exactly what I wanted. I've learned my lesson. No more wasted time with "computer store experts." I'm just calling the real experts at MacConnection! Thanks for the help!

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Omaha, NE

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Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!

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ON Technology ... 1 year MBG

9801 ❼ *Meeting Maker (5 user)*–Plan, schedule & confirm meetings via network. Schedule a time & date, select required guests, & prepare agendas. Personal calendar to block out activities . $309.

9800 ❼ *Meeting Maker (10 user)* 549.

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7748 Personal LaserWriter Toner Cart. . . . 89.

1115 LaserWriter II Toner Cartridge 105.

★Avery ... 60 day MBG

4807 Laser Labels 1" x 2⅝" *(Qty. 3000)*. . 24.

5392 Disk Labels 3½"-Laser *(Qty. 630)* . . 29.

1600 1st Impression *(desktop bindery)* . 229.

★Basic Needs ... 60 day MBG

Full line of Dust Covers, Stands, etc. call

★Computer Coverup ... 60 day MBG

9501 Mac LC w/12" Monitor Cover 10.

CoStar

6091 The Organizer. . . 199. 7453 Jr. . . . 82.

★Curtis Manufacturing ... 30 day MBG

8046 MVP Mouse *(MVP-1)*. 89.

Ergotron

MacTilt *(Classic, SE, SE/30, II)* ea. 75.

★Goldstein & Blair ... 30 day MBG

1913 The Mac Bible Guide to System 7 . . 10.

8374 ❼ The Macintosh Bible *(with disks)* . 25.



ASD Software ... 30 day MBG

MaccessCard Reader combined with FileGuard 2.7 secures your Mac against unauthorized users.

7085 ❼ *FileGuard 2.7 (1 user)* $139.

9440 *MaccessCard Reader (reqs. FileGuard)* . . 399.

9439 ❼ *MaccessCard/FileGuard (1) Bundle* . . 399.

IDG Books

2238 Macworld Guide to System 7. $19.

★I/O Design ... 30 day MBG

8812 Ultimate Classic Carrying Case 64.

6129 Ultimate SE/Ext. Carrying Case . . . 79.

1941 Ultimate LC Carrying Case 95.

★Kensington ... 30 day MBG

Full line available. Partial listing.

4973 Power Tree 20 27.

2573 Tilt/Swivel *(platinum)* 24.

2559 Apple Security Kit 33.

9303 Keyboard Shelf 39.

2010 MacClassic Anti-Glare Filter 45.

6763 SE Radiation/Anti-Glare Filter 52.

5064 Apple Color Monitor Polarizing Filter 63.

★MacConnection ... 60 day MBG

1505 Oak Disk Case *(36)* 21. 4623 *(90)* 32.

8795 Switch Box *(2 Pos.)* 32. 8796 *(4 Pos.)* 49.

★Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT *(Platinum)* 53.

★Moustrak ... 60 day MBG

2694 Moustrak Pad *(7"x9")* 8. 2692 *(9"x11")* 9.

2693 Moustrak Pad Low Friction *(9" x 11")*. . 10.

Mouse Glove *(various colors)* . . . ea. 9.



Prometheus ... 30 day MBG

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1603 DG60M. . . 18. 2520 DG90M. . . 28.

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CIRCLE 92 ON READER SERVICE CARD.

NEW ON THE MENU

Defendo, ergo sum: Wolfsbane or holy water used to be enough protection from elves, but fighting today's ELF requires a display filter. The Ergo:Shield line, from Radius ([408] 434-1010), is the most sophisticated display filter available, providing glare reduction and protection from ELF and VLFelectric-field emissions by using a conductive ceramic layer in the filter. The Ergo:Shields are designed for Radius monitors and list from $150 to $299. Wolfsbane is definitely cheaper.

By Russell Ito

One size fits all: With one notable exception, integrated packages on the Mac have been anything but stellar successes. The Jazz age passed quietly, leaving budget-conscious users hard at Works. But one-stop software is making a big comeback. ♦ Following closely on the heels of Symantec's GreatWorks, which we highlighted last month, Claris ([408] 727-8227) has announced its much-awaited integrated package, ClarisWorks ($299). Unlike in GreatWorks, all of ClarisWorks' five "environments" (word processing, spreadsheet, database, drawing, and telecommunications) are accessible at any time. Users can switch among the tasks simply by clicking on a tool palette that changes the menus accordingly. As you'd expect, the overall look of ClarisWorks is consistent with that of Claris' other products: MacWrite II (a word processor), Resolve (a spreadsheet program), MacDraw Pro (a drawing program), and FileMaker Pro (a database manager). Color (8-bit, or 256 colors) is supported in all the environments except telecommunications, and the package also includes 20 XTND translators for file compatibility. ♦ Beagle Bros ([619] 452-5500), the original developer of AppleWorks 3.0, has taken a similarly nonmodal approach to BeagleWorks ($299.95). BeagleWorks includes seven modules (word processing, database, spreadsheet, charting, drawing, painting, and telecommunications), all of which (except telecommunications) support 8-bit color. The package also offers XTND translators for sharing files. Switching among modules requires a menu choice, but once you've created an element, you can return to the originating module by double-clicking on the element. BeagleWorks also supports hot links among documents — even for System 6.0.5 users — so you can edit data in either the original or the destination document and the updated information will be carried through appropriately. ♦ With all the collected "works," ensemble software may yet be the pick to click.





Up to Date . . .

MORE 3.1 is Symantec's System 7 upgrade of its outliner/presentation package. Version 3.1 includes support for aliases and TrueType. (408) 253-9600. $395. ♦ 4th Dimension 2.2 is ACIUS' System 7 upgrade to its powerhouse relational-database manager. 4D now supports TrueType and Apple events. (408) 252-4444. $795. ♦ OmniPage 3.0 is the latest version of Caere's OCR package. In addition to System 7 support, version 3.0 includes a spelling checker and the ability to recognize draft-mode dot-matrix recognition output. (408) 354-2743. $695.



RasterOps' CorrectColor System includes the CorrectColor Calibrator, which assures that the CorrectScan 300 scanner and the CorrectPrint 300 dye-sublimation printer can produce consistent output.

RasterOps: Complete Color

Photo-realistic 24-bit color may look great on-screen, but printing those colors generally produces predictable results: mismatched colors. Not only has it been nearly impossible to reproduce the full range of colors on a desktop system but accurate reproduction has also been truly impossible. With this in mind, RasterOps has introduced the CorrectColor System, which consists of the CorrectPrint 300 continuous-tone color printer, the CorrectScan 300 high-resolution color scanner, and the CorrectColor Calibrator color-calibration unit. The price is less than $25,000, including the cost of a Mac.

The CorrectPrint 300 clearly raises the stakes in desktop color printing. A 300-dpi PostScript-compatible dye-sublimation printer, the CorrectPrint 300 produces photographic-quality letter- or legal-sized prints. These prints are reportedly produced at a rate of five minutes per page or less. RasterOps is seeking to drive prices down to about $2 to $3 per page.

The heart of the CorrectPrint 300 is an LSI 33000 RISC chip, which gives it speed as well as power. RasterOps says that the printer can decompress JPEG-compressed images for printing, so users will be able to reduce their network traffic by sending only compressed files to the printer. And for network versatility, the CorrectPrint 300 includes AppleTalk and EtherTalk ports.

Although the CorrectPrint 300 doesn't have Adobe's PostScript page-description language, RasterOps pledges full PostScript compatibility and has also committed to making the unit fully PostScript Level 2-compatible through a ROM swap.

To keep up with the amount of data it has to process, the CorrectPrint 300 comes loaded with 12 megabytes of RAM, which can be increased to 48 megabytes. Lots of RAM is essential, because a single 24-bit legal-sized print can easily require 36 megabytes.

Because most users who are interested in the CorrectColor System won't end their color endeavors with the CorrectPrint 300, RasterOps also offers software that can calibrate the CorrectPrint 300 to the final output device.

The CorrectScan 300 is a 300-dpi flatbed scanner that uses a three-pass scanning engine that can handle up to 7 bits' worth of data. This SCSI device can scan images as large as 8.5 x 11 inches. As part of the CorrectColor System, it can be calibrated to the monitor and printer to provide accurate color input.

The CorrectColor Calibrator, which was announced in May, ties the whole system together. It's a device-independent unit that can calibrate a color system based on a monitor or on printed media, including transparencies, prints, and photos.

By assuring consistent, accurate color from input to display to output, RasterOps has created a product that promises to take a lot of the cost — and anxiety — out of desktop color work.

RasterOps, 2500 Walsh Avenue, Santa Clara, CA 95051; (408) 562-4200. Individual prices were not set at press time.

SuperPaint, Take Three

Three-point-oh seems to be the magic number in drawing packages. Illustrator, Canvas, and SuperPaint have all attained "threeness" in the past 12 months. Of the trio, however, only SuperPaint has undergone a metamorphosis. The Mac's first combination painting/drawing package, SuperPaint sorely needed a major upgrade, and version 3.0 is it.

Unlike version 2.0, which was an 8-color (not 8-bit) package, SuperPaint 3.0 is a 32-bit package, with full support for 16.8 million colors. Users can work in 1-, 8-, 16-, or 24-bit-color modes and can even work on a 24-bit image in 8-bit display mode. Other enhancements include pop-up and tear-away palettes as well as a variety of fill effects, including textures, gradients, colors, and patterns. Although users can specify the direction and type of gradients, they're limited to 256 colors within a gradient.

SuperPaint 3.0 also offers image enhancement, so you can adjust an image's brightness and contrast; alter the color balance; and then apply effects such as masking, smudging, diffusing, lightening, darkening, and inverting. Black-and-white as well as color TIFF images can be placed and edited in SuperPaint 3.0.

Aldus Corp., 411 First Avenue S., Seattle, WA 98104; (206) 628-2320. $199.



SuperPaint 3.0 is a major overhaul of the Mac's first combination painting/drawing package. It's now a 32-bit-color program that has photo-enhancement capabilities.



RasterOps' MediaTime is the first NuBus board to handle both digital video and CD-quality digital stereo audio.

MediaTime: Sound+Vision

By now most users have probably been treated to at least one eye-popping demonstration of digital video on the Mac, but Mac-based CD-quality audio has largely been kept segregated and in the hands of MIDI hackers. RasterOps, however, may change all that with MediaTime, the first single NuBus board that can handle both digital video and 16-bit CD-quality digital stereo sound.

MediaTime can accept video input from any composite or S-video source, digitize it, and display the video in a window as large as 640 x 480 pixels. It can also accept video in NTSC, PAL, and SECAM formats. For those who don't need digital video now, MediaTime works as a video board for an Apple 13-inch RGB display.

On the audio side, MediaTime sports a DSP (digital signal processing) chip that can digitize audio and write the digital audio data directly to a hard disk. RasterOps also supplies software for editing the digital signal.

If you really want to turn your hard disk into a "digital videocassette," you can add RasterOps' QuickPak Video Compression daughterboard to MediaTime. With the QuickPak, MediaTime can compress and decompress live video on the fly, at ratios of up to 30:1, using the JPEG compression standard (the QuickPak board uses a dedicated JPEG chip from C-Cube). So with the QuickPak board installed, you can write digital video as well as CD-quality digital stereo audio directly to disk.

RasterOps, 2500 Walsh Avenue, Santa Clara, CA 95051; (408) 562-4200. MediaTime should be available this winter, for less than $3,000.

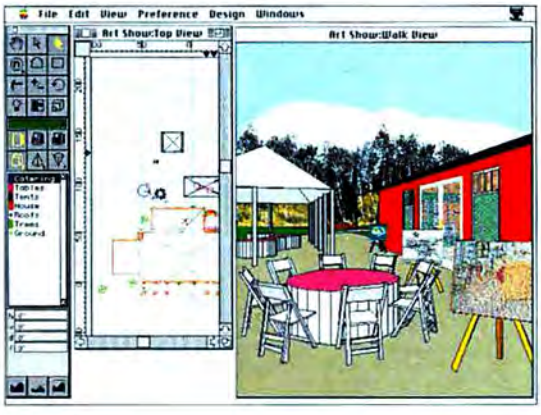
Interactive 3-D

When Virtus WalkThrough debuted, it literally took 3-D in a new direction, letting users create spaces and randomly "walk" through them. Virtus has introduced its second package, Virtus Vision, which takes the Virtus WalkThrough paradigm even further.

Virtus Vision is a 3-D modeling, visualization, and simulation package that supports texture mapping for more-realistic images. Through System 7 and Apple events, Virtus Vision can interact with HyperCard 2.1. With the Apple-events capability, users can interact with 3-D objects, seamlessly enter a HyperCard environment, trigger a HyperTalk script, and then return to Virtus Vision.

Costing $500 more than Virtus WalkThrough, Virtus Vision is intended as a professional tool for architects, graphic designers, and users such as production designers in the film and video industries who need to present 3-D environments.

Virtus Corp., 117 Edinburgh S., Suite 204, Cary, NC 27511; (919) 467-9700. $895.



Virtus Vision is a new type of 3-D tool that lets users interact with 3-D objects. Through System 7 and Apple events, you can seamlessly enter and exit from HyperCard 2.1.

NewsLine

Reports and Analysis

Borland Buys A-T

SCOTTS VALLEY, CA — Borland International has announced plans to acquire Ashton-Tate. The companies will merge in a stock swap estimated to be worth $437 million. Borland's move is a major step toward its goal to become a principal in the database-manager market. Estimates of the combined companies' share of the PC-database-application market run as high as 65 percent. The merger could spell the end for Ashton-Tate's Mac products, FullWrite Professional and Full Impact. At press time, there was no word on their future.

MacroMind and Paracomp Merge

SAN FRANCISCO, CA — Turning multimedia into a monoenterprise, MacroMind and Paracomp have signed a letter of intent to merge the companies into a single venture to be called MacroMind/Paracomp. Although no financial terms have been revealed, the deal was expected to have been completed by mid-August.

Chipsoft Acquires Softview

SAN DIEGO, CA — Chipsoft, the publisher of TurboTax, and Softview, the publisher of MacInTax, will be filing a joint return from now on. Chipsoft has acquired Softview, and the companies will merge their operations into a single unit based at Chipsoft's San Diego headquarters. Chipsoft plans to discontinue TurboTax for the Mac and will provide a convenient method for TurboTax users to convert to MacInTax. Chipsoft is also in the process of re-evaluating Softview's other products, including if:X Forms Designer and Mac-in-Use. Chipsoft will support all of Softview's products.

IBM Buys Metaphor

MOUNTAIN VIEW, CA — Making a move to enhance its alliance with Apple Computer, IBM has announced plans to buy Metaphor Computer Systems. In September 1990, Metaphor and IBM established a joint venture called Patriot Partners. The concept of Patriot Partners was to design software that would allow a single program to run across a variety of platforms — from Macintoshes to workstations. Patriot Partners, whose efforts weren't expected to be completed until 1993, will be rolled into the joint software venture IBM plans to create with Apple.

NETWORKING

Schedule+ and Meeting Maker

Workgroups looking for a way to schedule meetings over a network should take a look at these two group-scheduling packages.

Savvy users of E-mail soon recognized its value not only as a means of sending messages electronically but also as a foundation for more-sophisticated workgroup applications. Two such applications have recently emerged in the form of group schedulers. Microsoft Schedule+ and Meeting Maker combine E-mail and calendars, enabling workgroups to schedule events and resources, view each other's schedules, and propose meetings over a network.

The two programs share a similar goal, but their approaches differ significantly. Microsoft Schedule+ is an easy-to-use, bare-bones scheduler that piggybacks onto the fully featured Microsoft Mail. Meeting Maker, on the other hand, is a package with lots of scheduling features built onto its own basic messaging system. As a result, it provides more scheduling capability, but you can't enclose files containing proposals or add forms to the system, as you can with Microsoft Schedule+ and Mail.

Schedule+

Schedule+'s most notable strength is its simplicity. Users will take to it quickly and easily. When you log in, the program's main display shows a monthly calendar, a scrolling daytimer, a list of users on the network, and a notes field. Each of these four interface components is a fixed window into the data it holds, a characteristic that adds to Schedule+'s simplicity but at times detracts from its functionality.

In the daytimer, you can scroll easily through the day's meetings but you can view only nine-and-a-half hours of a day at a time. In the monthly calendar, you can click on a button to view months from prior or subsequent years or to view different months in the current year but you can view only one month at a time. Highlighted dates indicate that events are scheduled on that day, but you can't see how many events are scheduled until you click on the date.

You go to the user lists to select and view calendars of other users on the network. In the Personal and Local listings, you select among the names by scrolling through the entire list and manually checking each user whose schedule you want to view, which is a time-consuming process if you have a large network. However, Microsoft has made it easy for you to create your own Custom lists; you can add users by typing the first one or two characters of their name and pressing Return.

The program's scrolling notes field is very small, and it doesn't let you tag notes to any particular meeting. Nor can you view more-detailed notes easily without printing them out.

Yet despite these limitations, we found Schedule+'s minimalist approach a real plus when it came to actual scheduling tasks. The program is a good choice for both group and personal scheduling. As a personal scheduling tool, Schedule+ offers some advantages over single-user scheduling programs. Unlike Alarming Events, from CE Software, for example, Schedule+ doesn't force you to start with a blank daytimer and fill in times for meetings. Nor do you have to fiddle with a daytimer window that's separate from your monthly calendar. To its credit, however, Alarming Events does let you view more than one month at a time.

For group scheduling, Schedule+ makes it wonderfully simple to check the unscheduled times of other users on the network. To do so, you simply select names by clicking or dragging in the lists and Schedule+ brings up a single or composite daytimer view that shows one or more schedules. In addition to your own appointments, the daytimer displays the selected users' booked times by highlighting them in gray. You can then propose a meeting at a free time simply by selecting the hours and using the Mail Request command to send a Microsoft Mail message to the users, asking them to attend the meeting.

Schedule+ also lets you log on to a user's calendar and view the actual appointments, if you know the user's password (which can be different from the Mail password). Then you can book meetings right into that user's calendar. What you *can't* do, however, is automatically schedule yourself or anyone else for regular events (such as a weekly 9 A.M. meeting) without manually cutting and pasting it throughout your calendar and the calendars of all the attendees.

Because Schedule+ is integrated with Microsoft Mail, it benefits from some of Mail's capabilities. For instance, you can enclose an unlimited number of documents and send them along with your Meeting Requests. Mail also lets you use Schedule+ to create specialized forms for booking rooms and resources.

But the integration with Mail also has some limitations. Schedule+'s data is stored on the Mail server, so you can't access it unless you're connected to the Mail system, which makes remote access a problem. Plus, if the Mail server crashes, you don't have the security of a locally stored copy of your schedule.



Schedule+ is a bare-bones workgroup scheduler that borrows some features from Microsoft Mail, which is its foundation. A single screen provides access to most of Schedule+'s functions.

Meeting Maker

Schedule+ is a decidedly lean scheduling application, whereas Meeting Maker is fully featured. As a result, the program's performance is more sluggish than that of Schedule+. Moreover, users must cope with significantly more visual information than Schedule+ provides. Meeting Maker uses many pull-down menus, windows, and dialog boxes, and its interface isn't always predictable.

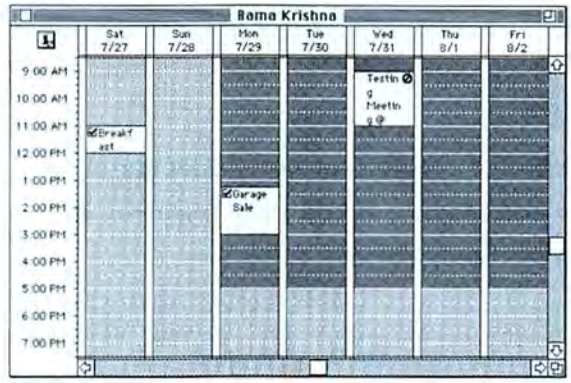
For starters, when you log in, you get a graphical representation of a week's schedule that's expandable to two weeks. You can manipulate the calendar's graphic elements, but when you narrow the daily columns, the text that describes scheduled events divides in strange ways.

Meeting Maker also has a monthly calendar that graphically shows you the number of appointments scheduled for a particular day. But you can see only a month at a time, even though the calendar's window expands, leading you to think you can view more months. You can group the meeting-related messages you receive into active ones (those you haven't responded to), proposals, CCs, and refusals, but Meeting Maker doesn't let you view all your messages at once.

You can order Meeting Maker's to-do list by priorities and subtasks, but you can't promote or demote items by clicking and dragging them to a new place on the list. Instead, you must order them alphanumerically, which gets tedious and time-consuming.

These idiosyncrasies aside, Meeting Maker is still impressive. But the flip side to its rich feature set is a steeper learning curve than that of Schedule+, which can be a problem if you're looking to convert your entire office to electronic scheduling. For example, you begin most Meeting Maker actions in one window and finish them in another. You click on a proposal or a time for a meeting, and another window pops up with buttons that require you to specify the meeting topic, location, attendees, schedule, and agenda. Yet another window is required for entering this information.

This complex approach can have decided advantages, however. Meeting Maker can supply a tremendous amount of detailed scheduling information based on the data you enter. For example, you can decide how each person is to be listed in your meeting proposal: Are they required or optional, or are you just sending them a carbon or blind copy? Meeting Maker can also show you a visual breakdown of the number of required and/or optional attendees of a particular meeting. The end result is a tool that lets you fine-tune your scheduling in ways that Schedule+ can't.



Meeting Maker provides more scheduling features than Schedule+ does, but it's more complicated to use. A decided plus for Meeting Maker is that it lets you view daily and weekly information simultaneously.

Meeting Maker is even capable of selecting the earliest time that a group of users is free for a meeting. It lets you designate proxies who can schedule meetings for you. Unlike Schedule+, you can also easily schedule recurring meetings on a daily, weekly, monthly, quarterly, or annual basis.

Last but not least, Meeting Maker provides more flexibility for printing schedules than does Schedule+. You can print output that is customized for use with daytimers, and you have complete control over the data that's printed.

We did encounter one flaw with Meeting Maker. Although it lets you search for titles, agendas, comments, or notes, starting on a date you specify, it searches *indefinitely* if it can't find your selection. You must stop it manually.

Overall, we found Meeting Maker superior to Schedule+ for long-range planning. Not only can you view daily schedules for as many as two weeks, compared with one week for Schedule+, but you can also schedule recurring meetings. It's also easier to spot clusters of heavily scheduled time frames on Meeting Maker's calendar, because the program uses special symbols that indicate how much of a particular day is booked.

The Bottom Line

Both Schedule+ and Meeting Maker are easy to set up and maintain. Each program lets you distribute calendar information among servers and purge old data from the system. But there's a clear trade-off between the two packages. Schedule+ is a basic scheduler constructed for use on the full-featured Microsoft Mail E-mail package. Looking ahead, it's safe to say that Schedule+ is likely to become a single module in a groupware family that will share the same Mail server as Microsoft Mail.

Meeting Maker, on the other hand, is a powerful scheduler that contains many more controls and features than Schedule+ does. But it's also more difficult to use, somewhat sluggish, and integrated with a messaging system that's underpowered. Moreover, it's not even integrated with its sister product, Instant Update, a groupware document editor. As a result, if you want to add an E-mail package or more groupware to your network, you'll have additional name lists and servers to maintain.

— Michael Miley

Get Info

Meeting Maker

tttt

Published by: ON Technology, Inc., 155 Second Street, Cambridge, MA 02141; (617) 876-0900.
Version: 1.0.
List Price: 5 nodes, $495; 10 nodes, $895.

Schedule+

ttt½

Published by: Microsoft Corp., One Microsoft Way, Redmond, WA 98052; (206) 882-8080.
Version: 1.00a.
List Price: 5 nodes, $195; 20 nodes, $775 (doesn't include Microsoft Mail).

GRAPHICS & DESIGN

MacDraw Pro

MacDraw's modern descendent is considerably more powerful than its ancestor, but the new features in MacDraw Pro exact a performance price.

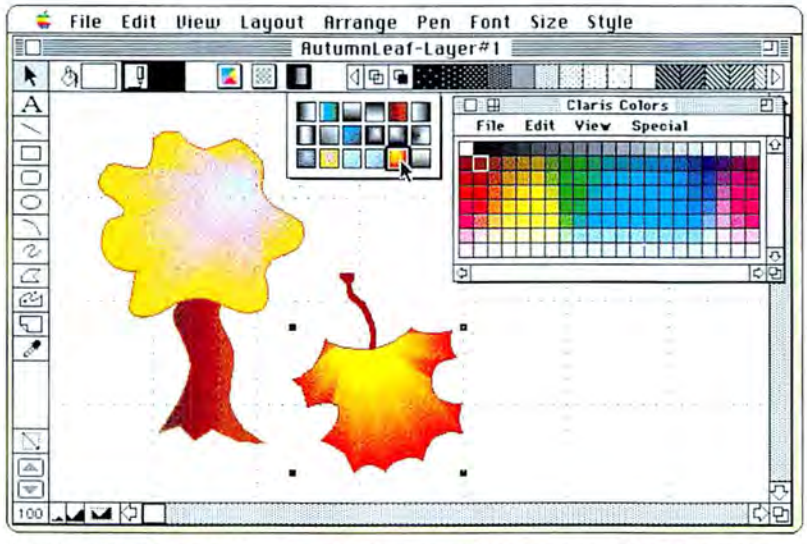
If you expect MacDraw Pro to be similar to its grandparent, the original MacDraw, you're in for a surprise — a pleasant surprise. Although its interface continues to be a paragon of ease of use, the new version features improved text handling; a wide range of import capabilities; a new Bezigon tool; and 32-bit-color support, including gradient shading. MacDraw Pro has grown into a solid illustration program that may not be as "pro" as Freehand or Illustrator, but it's an excellent, all-purpose tool for simple page layouts and complex charts.

No More Mass Appeal

Of course, as a drawing program, MacDraw continues to offer precision in drawing, measuring, and object placement. The latest version, however, is not a drawing program for the masses, despite its ancestry and ease of use. At $399, with a total of more than 2 megabytes of files in the package (including all support files) and requiring 4 megabytes of memory, MacDraw Pro is not for beginners or dilettantes. But if you need a simple way to get at sophisticated tools and a versatile package that can handle many tasks, MacDraw Pro fills the bill.

MacDraw's strength has always been its interface, and the new version is no exception. MacDraw Pro's overall design and its attention to detail add up to an elegant, uncluttered, and intuitive interface that easily incorporates new features and functions. Claris has made sure that there's a shortcut available for just about every function and that there's almost always more than one way to accomplish tasks.

Users of previous MacDraw versions will feel right at home with MacDraw Pro. The Tool palette is still conveniently nestled along the left edge of the document window. You can use the Enter key to toggle between the palette's Selection arrow and the most recently used tool and can use the Tab key to toggle between the Selection arrow and the new eyedropper tool. You can also choose an option that lets you select any tool simply by typing the first letter of its name. A fractional zoom control (from 3 to 3,200 percent), which lets you zoom in on specific areas of drawings by selecting an area on-screen, is also new. A well-designed shortcut lets you change zoom levels simply by pressing a corresponding number key.



To make it easy to work with color, MacDraw Pro provides pop-up palettes that you can tear off and expand.

Major Enhancements

Major enhancements to MacDraw in this version are the new Bezigon tool, the convenient tear-off palettes, extended color and file-exchange support, and improved text handling.

Using the new Bezigon tool (that's *Bézier* combined with *polygon*) is simplicity itself, once you've figured out the basics of Bézier curves. You click on the points through which the curve is to pass and use handles attached to the points to adjust the curve's shape and size. Although you can use the Reshape command later to add and delete points and adjust curves, you can actually do much of the editing while you're drawing the object. Dragging a new point rather than clicking on it, for example, allows you to alter the curve as you're drawing it. If you want a straight-line segment, you can just press Option and click on the line's endpoints.

The familiar style bar that runs across the top of the drawing window now accommodates the addition of many more colors and gradients as well as a variety of standard patterns. Rearranging the order of items in the scrolling style bar is as easy as dragging an item from one spot to another. For a major overhaul, you can work from within expanded tear-off palettes. The palettes drop down to display colors, patterns, and gradients, or they tear off into floating windows for more convenient access to their contents.

Tear-off palettes also have an extra control located in their title bars that lets you toggle between reduced and full views. In reduced view, you simply click on the value you want. In full view, the palette provides scroll bars and lets you rearrange the samples and menus within it. The menus let you create, name, save, and retrieve custom palettes of colors, patterns, and gradients. You can also cut and copy samples and paste them into palettes, and you can even view them in larger blocks or by name.

The palettes are quintessential MacDraw. They provide a tiered approach to powerful features by letting you control how many selections you want to view and where. For quick color selection, you can choose from a pull-down menu. For

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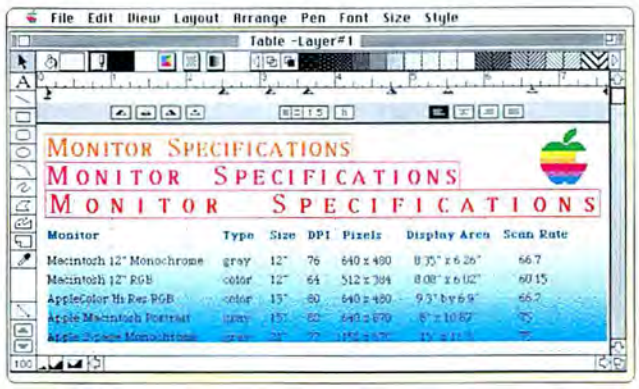
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MacDraw Pro includes a pared-down word processor that offers a text ruler with tabs, line spacing, and paragraph justification. The blue shading was applied to the text block itself.

more frequent color choices, you can tear off a palette. To rearrange or create colors, you can switch to the full palette.

With its incorporation of Claris XTND file-exchange architecture, MacDraw Pro supports more file formats than previous versions of MacDraw did. It supports files from MacPaint, MacWrite, and Word 4.0; ASCII text files; and PICT, TIFF, and EPS files. You can open foreign files as documents or as objects to be placed within MacDraw documents.

Also new in MacDraw Pro are text enhancements that add up to a pared-down, MacWrite-like word processor that's integrated with the drawing program. A text ruler not only provides margin and indent markers but also four types of tabs, different line spacings, and four justifications — just the basics for a word processor but quite amazing in a drawing program.

MacDraw Pro's ruler, however, would be more convenient if it were attached to text boxes instead of to documents. As it is, when you set tabs at certain intervals and then move the text box, the tab spots are still at specific points on the page rather than in the block itself.

Imported text and word-processor files are fully editable within MacDraw Pro, and they maintain their original formatting, including font type, font size, tabs, and alignment. When you import a word-processor file with embedded graphics, the graphics arrive as separate objects in MacDraw Pro.

Claris has done an outstanding job with the interface when it comes to text creation. You don't even have to specifically select the text tool and define text boxes. Typing while any text object is selected automatically creates a text box of the same height and width as the selection. You can't fill or surround irregular shapes with text or bind text to a curve, but you can rotate text to any angle, assign it a color, and adjust its horizontal spacing to fill specific widths. You even get a spelling checker that can monitor your efforts in real time, or you can choose to activate it when you've completed your text entry. Because MacDraw Pro is a Claris product, it lets you use the user dictionary from other Claris applications, such as MacWrite.

Fine-Tuning

Although its major enhancements have changed MacDraw for the better, there are dozens of smaller changes that also add to the program's power and ease of use.

The new eyedropper tool lets you pick up line or fill colors and patterns (including gradients) in any object in a document and apply them to other objects.

MacDraw's slide-show features have been improved, although MacDraw Pro still doesn't supply special effects for transitions. However, the new version makes it easier to rearrange the order of slides, and you can cut and paste multiple slides between documents. There's also support for remote-control devices.

Among the many preferences you can set for your work environment is one that's terrific. MacDraw Pro provides a smart-interface feature that lets you set constraining angles when you draw. The Shift constraint that normally draws a line in horizontal, vertical, or 45-degree directions can be redefined to any angle.

Another handy new feature is the note tool, which lets you attach electronic notes to documents. You can choose to display or hide notes and print documents with or without them. This feature is very useful when you're creating presentations.

Despite its considerable strengths, MacDraw Pro suffers from a few significant problems. Foremost among them is the performance hit the program has taken as a result of its beefed-up functionality. It's incredibly slow when you're working with gradients — circular ones in particular. On a Mac IIcx, opening one of the program's sample files took 35 seconds and switching from one level of magnification to another within the document took 25 seconds. A document setting (Fast display of Gradients) can mitigate this problem somewhat by representing gradients with bands of fewer colors. With the option activated, it took 4 seconds to change magnification levels in the same document. Of course, this option doesn't help with slide shows, in which you want the true gradient displayed on-screen at all times.

In addition, just as System 7-savvy applications are becoming the hottest thing since sliced bread, MacDraw Pro's lack of System 7 expertise is somewhat of a shock. Although it behaves under System 7, it lacks basic System 7 features such as balloon help and support for publish-and-subscribe.

The Bottom Line

Offered at the same price as the previous version of MacDraw — MacDraw II — MacDraw Pro is an excellent value. Although it suffers from sluggish performance for some tasks and its lack of System 7 savvy is disappointing, MacDraw Pro is a versatile tool that's adept at drawing, text handling, and presentation building.

MacDraw Pro doesn't threaten Illustrator nor does it have all of Canvas 3.0's bells and whistles, but most users will probably find it easier to learn and use than either Illustrator or Canvas. As with previous versions of MacDraw, MacDraw Pro's key strength is its well-designed interface. If you're already familiar with MacDraw, the new version will feel like an old friend, albeit with many more talents.

— Sharon Zardetto Aker

Get Info

MacDraw Pro

★★★★

Published by: Claris Corp., 5201 Patrick Henry Drive, Box 58168, Santa Clara, CA 95052; (408) 727-8227.
Version: 1.0v1.
List Price: $399.



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PRINTERS

Kodak Ektaplus 7016

Kodak's latest offering does double duty as a network printer and a copier.

The switch-hitting Ektaplus 7016 is a 16-ppm (page per minute) printer that's also a plain-paper copier. Designed for small workgroups equipped with Macs and PCs, the printer sports an impressive four ports, six emulation modes, live emulation switching, and superior output quality. Unfortunately, the Ektaplus 7016 struck out in print performance for one of our composite PostScript test files and batted only average in overall performance.

First Impressions

Installing the Ektaplus 7016 is a breeze. We had the hefty, 85-pound printer running in only 30 minutes. Step-by-step illustrations detail the entire setup, including installation of the printer's consumable components.

The toner cartridge, which is good for approximately 4,000 impressions, is easily accessible and pops in with no mess, although you risk spilling toner if you remove the cartridge before it's completely empty. You can replace the cartridge independently of the developer unit.

The Ektaplus 7016 uses an LED (light-emitting diode) imaging array and a unique photoconductor film belt for 300-dpi output. The photoconductor belt can be used for up to 50,000 images before requiring replacement.

The printer incorporates Kodak's "small-particle developer" technology. The fine particles produce crisp images and high-density solids. As a result, the Ektaplus 7016 produces excellent output, with consistent dark blacks, sharp hairlines, even gray ramps, and fine type at small point sizes.

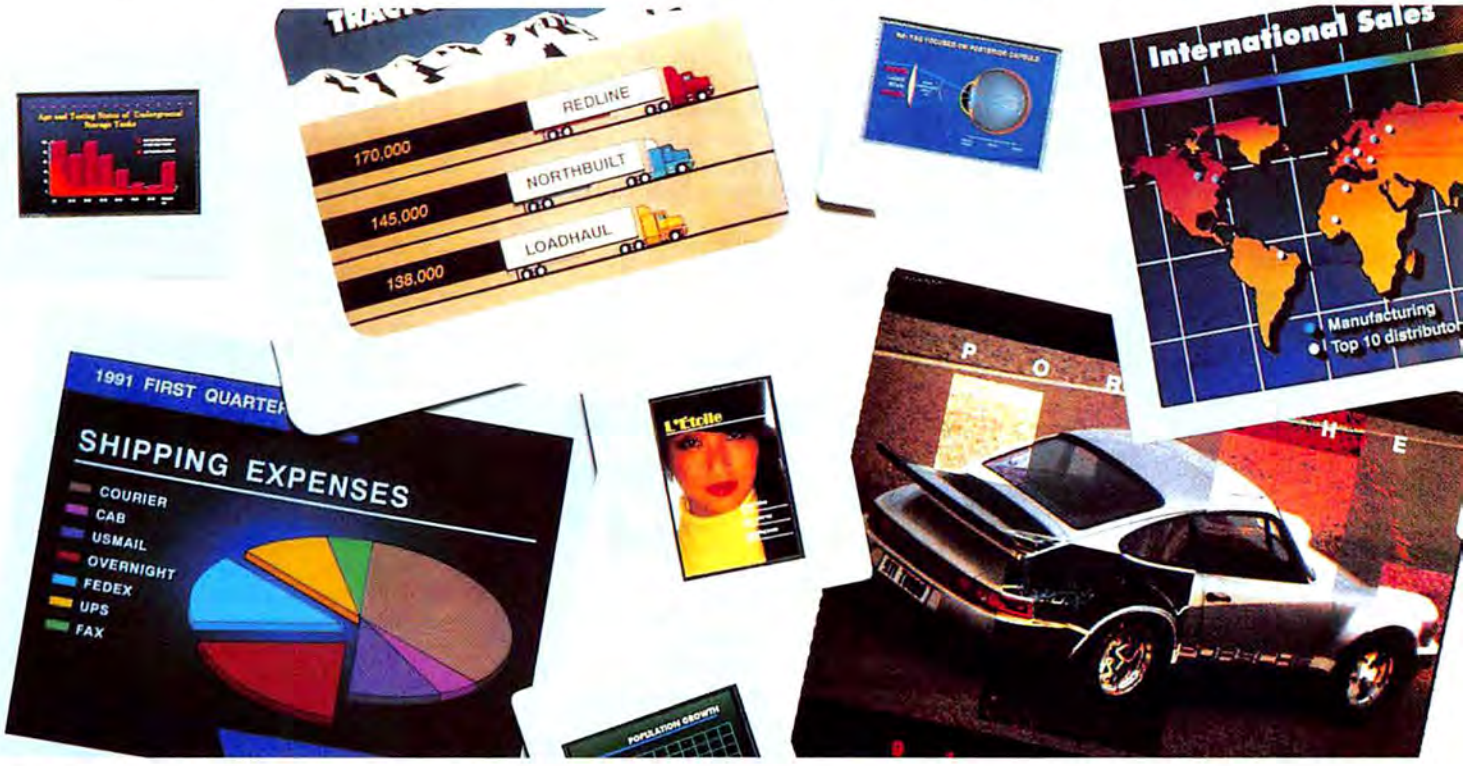
The printer's 512K ROM contains four Bitstream typefaces — Courier, Line Printer, and Helvetica and Times look-alikes — in various sizes and styles. Kodak also offers 17 proprietary font cartridges that plug in to the side of the printer, and you can download fonts, using the device's LaserJet-emulation mode. An optional $1,995 PostScript board comes with the standard 35 Adobe outline fonts and accepts downloaded fonts as well. Unfortunately, there is no way to attach a hard-disk drive for font caching. Version 1.4.3 of the Ektaplus driver doesn't appear to be TrueType-compatible, although we were able to print TrueType successfully with Apple's LaserWriter 7.0 driver. Performance suffered considerably, though.

The Ektaplus 7016 comes standard with Centronics parallel and RS-232/422 serial ports on the rear of the unit. Additionally, it has two empty ports for optional interface kits such as the AppleTalk board we installed in our Mac IIci benchmark computer. Multiple ports allow the Ektaplus 7016 to be shared among four computers directly connected to the printer. If one of those computers is replaced by a print server, the server can act as a gateway, allowing everyone on the network to share the printer. Theoretically, the printer can serve as many computers as the network supports, but based on its



The Kodak Ektaplus 7016 is both a printer and a copier. It offers live emulation switching, but the innovative device falls short when it comes to the speed of printing composite documents.

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recommended duty cycle, 750 sheets a day is the practical limit.

The Ektaplus 7016 can accept data from up to four sources simultaneously, but once its buffers are full, other ports must wait until the job in progress has been completed. Of course, if you're using a local print spooler or a dedicated print server, you can continue working at your computer. A server is also a good idea if you want more-sophisticated queue handling. Print order is based on who gets into the queue first and not on which job is completely transmitted first.

The Ektaplus 7016 can handle print requests from a variety of sources, thanks to its page-description-language emulators: Hewlett-Packard LaserJet II (HP-PCL), HP 7475A plotter (HP-GL), Diablo 630, IBM Proprinter, and Epson FX-80. The optional PostScript board adds Adobe PostScript emulation, a necessity for Macs connected with AppleTalk.

Once Kodak's Chooser-level printer driver has been installed, Mac users needn't worry about print modes. You send either QuickDraw or PostScript commands via AppleTalk, and that's all there is to it. DOS users, however, must make sure the printer's emulation mode matches the printer driver that's used with their application. They can do this either by manually changing the mode via the LCD panel on the front of the printer or remotely with the supplied DOS command-line utility EPLUS.EXE.

Performance Hitch

The Ektaplus 7016's 10-megahertz Motorola 68010 manages all the RIP functions, including communicating with the host, polling ports, buffering jobs, and interpreting the emulated page-description languages.

The printer comes standard with 2 megabytes of memory. Of that, 1.25 megabytes is allocated to page imaging, so the device can hold a full 8.5-x-14-inch page of 300-dpi graphics in memory. The extra 750K of memory is available for downloaded fonts and input buffers. You can add to this with an optional 2-megabyte upgrade, provided you haven't already filled the printer's one internal expansion slot with the optional PostScript board.

The PostScript board sports a 16-megahertz 68020 processor implementation of true Adobe PostScript version 52.3 with 4 megabytes of RAM. While the processor is chewing on PostScript commands, the main RIP board is free to address other print jobs.

To evaluate the speed of the Ektaplus 7016, we put it through our standard suite of tests (the Ektaplus 7016 came in too late to be included in our September '91 printer lab report [see "Getting Down to Business: Workgroup Printers," page 128]). Our 10-page Microsoft Word text document took an average of 1 minute, 6 seconds to print completely on the Ektaplus 7016, only scant seconds behind the best-performing 22-ppm QMS-PS 2210.



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MAXIMUM ON-LINE	3,745Mb	1260Mb	588Mb
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The Kodak device also turned in respectable results when printing our complex Illustrator PostScript file: 3 minutes, 25 seconds, an above-average speed but nearly half as fast as a LaserWriter with a RISC-based Xänte Accel-a-Writer II upgrade board.

Our composite Illustrator file, however, really taxed the Ektaplus 7016, requiring 13 minutes, 38 seconds, which was far and away the worst time of any PostScript printer we tested. Technicians at Kodak pinpointed the culprit as inefficient communications between the PostScript processor and the main RIP. As we went to press, Kodak claimed to have implemented a fix for this problem that cut the printer's processing time by half. However, even with that boost in speed, the printer continues to offer lackluster performance for composite files.

The Ektaplus 7016's paper handling is versatile. It comes with two letter-sized paper trays, each of which holds 250 sheets. The printer can automatically switch trays when one is empty. You can also place plain paper in one tray and transparencies in the other and then choose between the two via the Print dialog box. There's even an option that automatically prints the first page of a document on letterhead and subsequent pages on plain sheets. You can configure the paper-output tray for either faceup or facedown printing.

Envelope printing is another story. The printer's envelope slot is wide enough to accommodate only standard #10 business-sized envelopes. We prefer an adjustable, center-feed envelope slot that handles envelopes of any size. Also disappointing is the printer's handling of textured stock, which tends to smear. Envelopes can get skewed, because when you place an envelope or a manual-feed sheet in the appropriate slot, the printer inhales the paper automatically, often misaligning it. This is really a problem when you're bar-coding envelopes.

The Ektaplus can juggle printing and copying. The device continues to receive and process digital data while the 6-ppm copier is in use. Jobs in the print queue are put on hold until you've finished making copies, and then printing resumes automatically. Very slick.

The top-loading copier is convenient, but it's not as versatile as it should be. It can handle only 8.5-x-11-inch sheets that are manually inserted one at a time. Automated batch copying we can live without, but if the printer can accept legal and A4 paper, why can't the copier? Also, the copier has no magnification or reduction options. On the plus side, the copier cover is double-hinged to make it easy to place bound material flat on the platen glass.

The Bottom Line

At $7,190 for Kodak's PostScript model, the Ektaplus 7016PS, equipped with an optional AppleTalk board, you get both a printer and a photocopier. But be aware that at 3.4¢ per page, the Ektaplus uses the least economical consumables of all the PostScript printers we tested.

For overall performance, the Ektaplus gets a mediocre rating. Its speedy performance with text may attract number crunchers and wordsmiths, but the communications problem revealed by our composite-page tests means that the Ektaplus 7016 is not a good choice for complex DTP work. And even assuming that Kodak has resolved the PostScript problem, the Ektaplus 7016 would still earn only average performance ratings.

We're encouraged by the trend toward emulation- and port-switching network printers for mixed computing environments, and the idea of a printer with a built-in copier is one we've been espousing for years. Unfortunately, although we commend Kodak for taking the innovative first step, the Ektaplus 7016 needs some refinement before it earns our unconditional recommendation.

— Owen W. Linzmayer

Get Info

Kodak Ektaplus 7016

★★★½

Manufactured by: Eastman Kodak Co., Printer Products Division, 343 State Street, Rochester, NY 14650; (800) 344-0006 or (716) 253-0740.
Version: 1.4.3.
List Price: $5,495; 2-megabyte expansion board, $500; PostScript board, $1,995; AppleTalk board, $195; serial board, $95; parallel board, $95; font cards, $150 – $250; photoconductor kit, $85; toner kit, $130; legal-paper tray, $80; A4-paper tray, $75.

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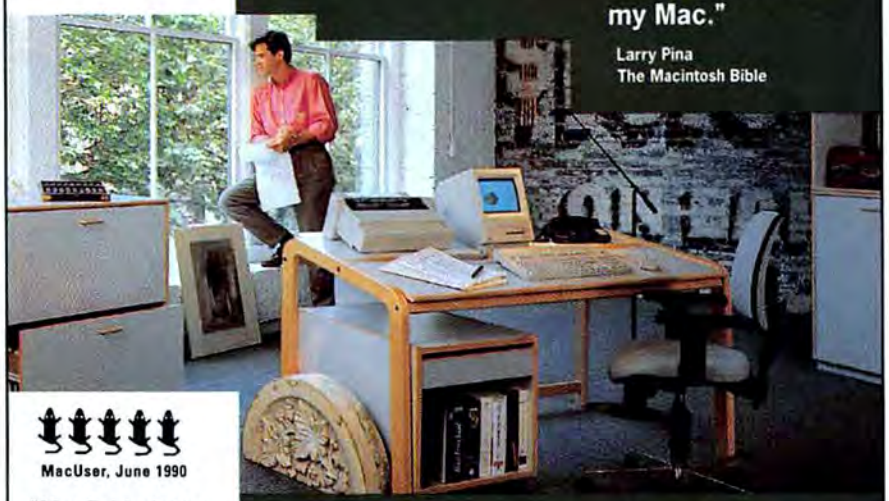
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MULTIMEDIA

Animation Works

Gold Disk's package makes it easy to create impressive animations.

Animation Works is a suite of powerful, affordable tools that simplifies the creation of Mac-based animations. Designed for use in presentations, Animation Works' animations can incorporate sounds and special effects such as wipes, mattes, and color cycling.

Animation Works is similar in price and abilities to Motion Works' ADDmotion, a $295 HyperCard add-in that requires HyperCard for producing and viewing animations. Animation Works doesn't require HyperCard, however, and the animations you create can be distributed and played back with the package's free Movie Player. You can also play Animation Works movies from within HyperCard, using an XCMD included with the package.

For broader distribution, you can output animations to videotape. To do so, however, you need to equip your Mac with additional hardware that converts Mac video into NTSC video and additional software to integrate the process.

Animation Works consists of three integrated working environments: The Background Editor is a 1-to-8-bit painting module for creating and editing backgrounds; the Cel Editor provides tools for creating foreground elements, called actors; and the Movie Editor is an environment for assembling animations from components and setting them in motion.

Background Editor tools comprise a basic selection of painting tools, including a brush, pencil, eraser, fill bucket, and definable airbrush. The module can also load and save PICT files.

The real power of the program, however, is in the Cel Editor's special tools and functions, which let you animate actors quickly and easily. Actors can consist of a single frame or a series of frames that make up a motion cycle — for example, one of the sample actors included

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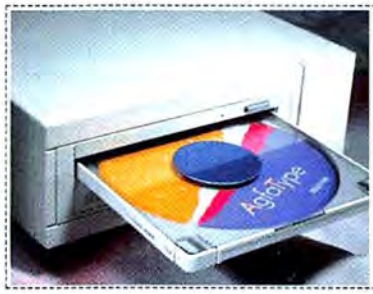
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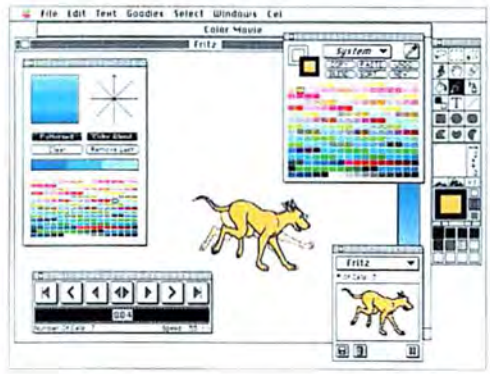
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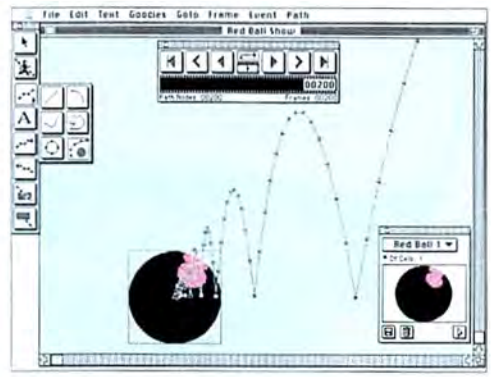
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REVIEWS



Animation Works is an easy-to-use set of painting and animation tools that automate much of the animation process. The Cel Editor, shown here, lets you compile a series of frames into animated actors. The ghost image behind the dog is an "onionskin" view of its position in the previous frame.



This red ball was rendered in a 3-D program and imported into Animation Works as a PICT file. The gravity tool in the pop-out menu automatically plots the path of the bouncing ball, although some manual tweaking is necessary.

with the package consists of 12 frames that comprise one full cycle of walking motion. You can play the actor at varying speeds, moving forward, backward, or in Ping-Pong motion.

Another useful Cel Editor option is the "onionskin" technique, which displays the current cel with a ghosted image of its previous or following cel.

Several tools automate entire motions such as zooming and rotating. For example, simply by setting a few options in two dialog boxes, you can create a block of text that zooms in, comes to a stop, and rotates. These complex motions are attributes of actors themselves, and you can create them without the Movie Editor.

Shortcuts

Several cleverly designed shortcuts and power tools within the Movie Editor further simplify the task of creating animated movies. To create animated text for a presentation, for example, you don't need to use the Background and Cel Editors. From within the Movie Editor, you can select a background item from the module's Events menu, load a PICT file, or create solid or gradient backgrounds. You can also select font, size, style, and color, and then you can use the Movie Editor's text tool to create the text.

When you're ready to define the text's motion, you can use the Movie Editor's registered-motion and path tools. The registered-motion tool is intended for use with multiple-cel actors. The path tools include straight-line, curved, freehand, and polygon paths plus two powerful tools called auto-path and gravity path.

When you select an actor and one of the standard path tools, the actor attaches itself to the cursor and you simply draw the path. When the path is complete, you tell Animation Works how many frames to use for it and whether the actor should accelerate or decelerate over a particular number of frames. Animation Works then draws the path for you.

The auto-path tool offers a variety of preanimated motions such as scrolls, spirals, bounces, and rebounds. And Animation Works' gravity path lets you define a direction for a path and then affect it with g (gravity) force, speed, and damping (air resistance).

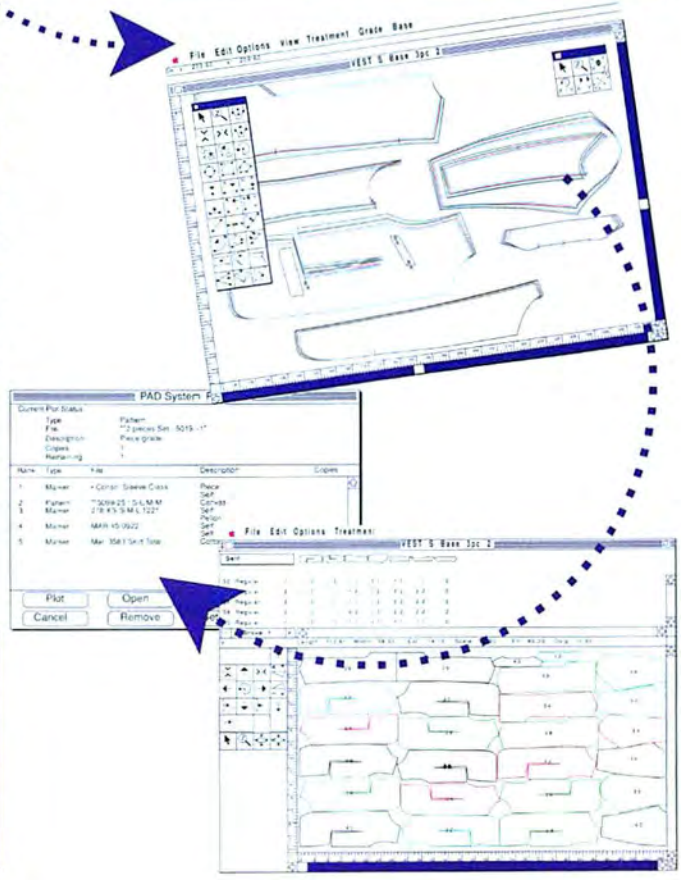
You can also set up complex paths hierarchically, with objects "magnetized" to other objects. One of the supplied examples shows a rotating moon orbiting a rotating earth while both objects orbit an animated sun. Although this appears to be

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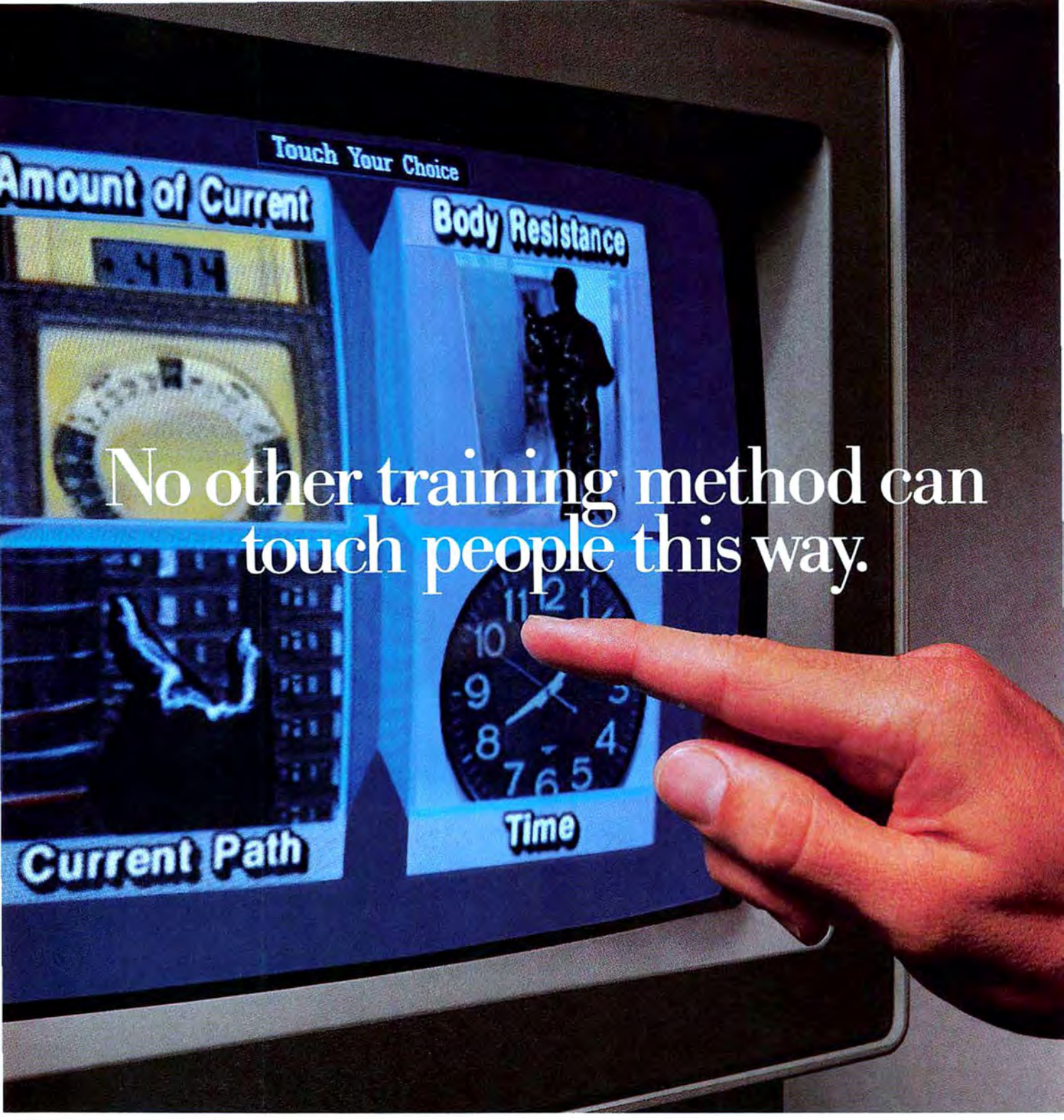


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a complex set of motions, Animation Works' automated tools go a long way toward simplifying its creation.

Animation Works also lets you enter pauses and loops at key frames to allow a basic level of interactive control.

Although it's an impressive first effort, Animation Works is not without shortcomings. We experienced several bugs and system crashes, and a few features didn't work properly. When we attempted to load a sound file, for example, Animation Works went into an endless loop that required us to reboot. As Gold Disk technical support suggested, we discovered that the conflict was with the Findswell INIT, a dialog-box extension. And although Animation Works functions with Adobe Type Manager, the letterspacing with large fonts needs improvement and kerning of text in presentation animations is decidedly odd.

The package does, however, come with an excellent manual that includes instructive tutorial sections, a well-written reference section, a complete index, and a quick-reference card. It also includes a videocassette that offers an introduction to the program's features and functions.

The Bottom Line

Given the breadth and depth of the Animation Works functions that worked flawlessly, we're confident that the few bugs we found in version 1.0 will be eliminated in subsequent releases. Overall, we were impressed with the thought that went into its design. Although Animation Works lacks the power of the $895 MacroMind Director package, which provides such high-end features as a scripting language and interactive control over playback, it's much easier to learn and use. Moreover, Animation Works is not only a useful tool for education and business applications but it's also a lot of fun!

— Lon McQuillin

Get Info

Animation Works
★★★½
Published by: Gold Disk, Inc., P.O. Box 789, Streetsville, Mississauga, Ontario L5M 2C2, Canada; (416) 602-4000.
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HYPERCARD

HyperBundle and Peacock

Two new utility programs bring polish and added functions to HyperCard stacks.

If you're a HyperCard-stack developer, HyperBundle and Peacock will keep you busy for hours on end. Each package offers valuable alternatives and extensions to HyperCard 2.0's use of palettes, icons, and text import and export.

HyperBundle

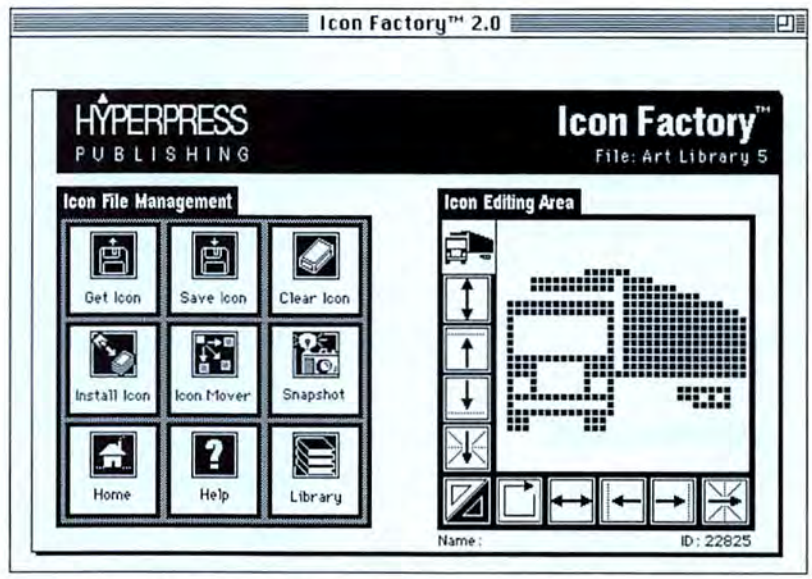
HyperBundle is a set of five utilities sold in a single package; you can also purchase each utility separately. Each is either new or upgraded for HyperCard 2.0. Although it's unlikely you'll be able to take advantage of every one of HyperBundle's components, the price nonetheless makes the package a good value.

The most promising HyperBundle utility is SuperPalette, authored by James L. Paul. Palette is a new feature of HyperCard 2.0 that provides floating windows for navigation and handy access to buttons. SuperPalette goes well beyond the capabilities of Claris' Palette XCMD by offering check boxes, radio buttons, pop-up and drop-down menus, locked fields, scrolling lists, a zoom box, and script control.

The utility consists of the SuperPaletteBuilder stack, a run-time XCMD, a HyperBundle Tools stack with useful prebuilt palettes, and documentation describing the palette-control properties. SuperPalette will delight developers looking for a way to add a touch of elegance and individuality to their stacks.

Another HyperBundle utility that excels at creating distinctive-looking stacks is Icon Factory, also by James L. Paul. Although HyperCard 2.0 provides a quite serviceable icon editor, Icon Factory offers additional graphics tools, including nudging, reverse-imaging, and mirroring. To help you create icons from preexisting art, the nifty Snapshot feature captures small bit-mapped images. Better yet, Icon Factory comes with a library of 2,000 exquisite art images.

A third HyperBundle utility is Dan Shafer's ScriptExpert, a learning tool that helps HyperCard novices get comfortable



HyperBundle is a set of five utilities that gives your HyperCard stacks new functions. The Icon Factory stack, shown here, provides an enhanced editing environment for creating icons and includes a huge library of detailed art.



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with HyperTalk scripting *without* the daunting experience of writing code in a blank script window. ScriptExpert lets you choose your vocabulary from on-screen buttons and provides guidance in the form of dialog boxes. This stack is ambitious, strangely interesting, and handsomely designed.

Rounding out the HyperBundle package are StepAhead and ScriptLibrary. StepAhead, a Home-stack alternative, is intended to make HyperCard more convenient by letting you open stacks, applications, documents, DAs, and notes from a single card. The stack lets you rename, copy, delete, and move files and folders as well as access sounds.

ScriptLibrary is a stack that serves as a repository for scripts. Because most HyperCard programmers' scripts tend to get strewn throughout their stacks, the idea of keeping an organized library makes sense. Unfortunately, both StepAhead and ScriptLibrary are likely to benefit only those who are meticulously careful in organizing and cataloging their work projects. Others may find that the demands of setup and maintenance aren't worth the effort.

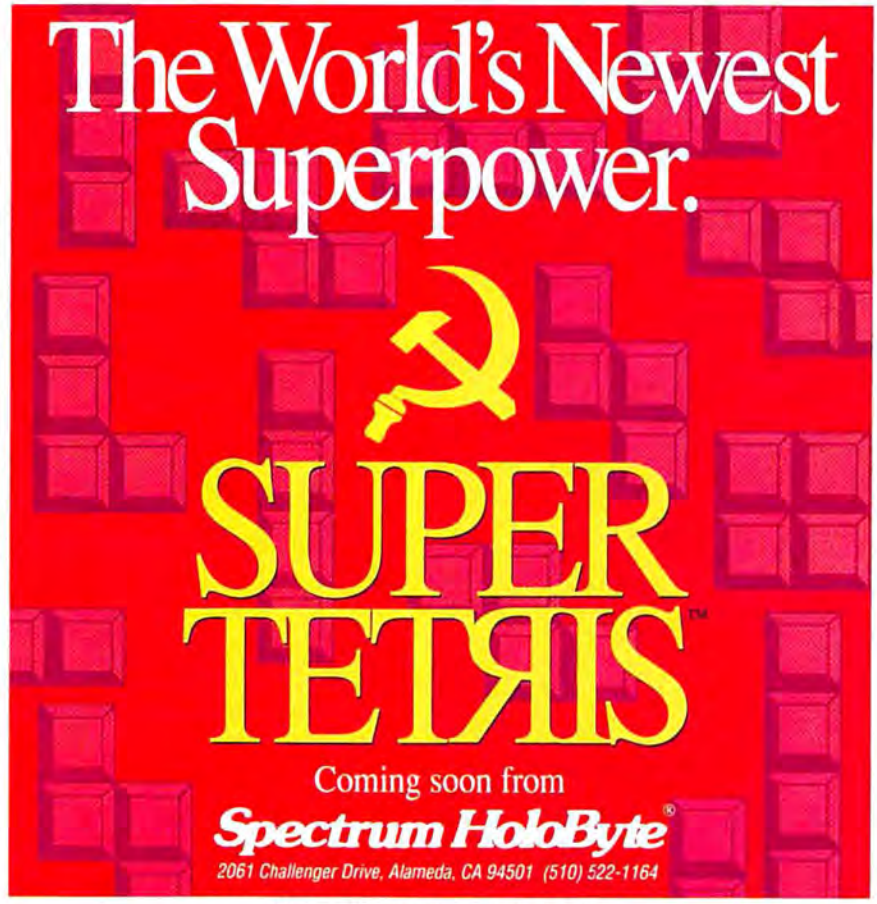
Overall, SuperPalette and Icon Factory stand out in this package. The remaining HyperBundle utilities are a bit amateurish and don't always work the way you want them to.

Peacock

Peacock is a single HyperCard 2.0 utility for importing and exporting text. Published by Cyan, creator of the remarkable Manhole and Cosmic Osmo entertainment stacks, Peacock offers a clever interface to assist users in transferring text between HyperCard fields and text files.

In addition to the actual text transfer, Peacock performs several auxiliary tasks. It lets you modify the delimiters that separate fields and items of fields, perform conditional operations that limit the transfer of text according to comparisons you've defined, strip out imported quote marks, and execute "posting" scripts that customize fields during the transfer.

Designed for people who are uncomfortable writing scripts, the utility comes with a clearly written manual that guides you through on-disk examples. It includes several elegant touches such as a layout list in which you simply click and drag background field names to match an imported text file or to position an exported text file. You can specify commas, tabs,



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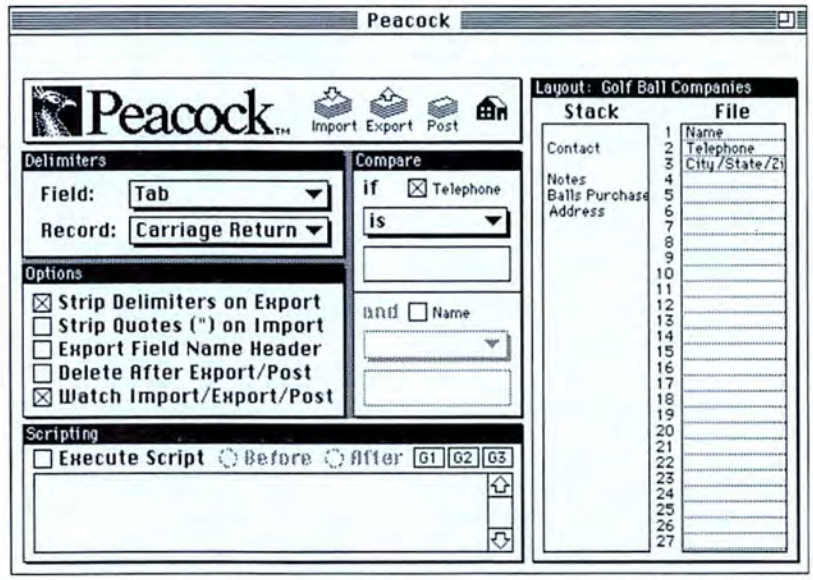
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CIRCLE 60 ON READER SERVICE CARD.



Peacock is a HyperCard utility that provides precise control over the import and export of background fields.

and other text delimiters or have Peacock automatically determine them for you.

Peacock performs its stated tasks well, although this first release of the product does have one limitation: It can export only background fields that have been named; it offers no means to export text stored on card fields, and if your background fields are unnamed, it will notify you via a dialog box that it has ignored such fields. A spokesperson at Cyan claims that this restriction makes the program easier for the majority of users to use, yet the company is considering an option for expanded export abilities in an upcoming release.

Peacock's smooth operation and ease of use may be just the ticket for heavy-duty HyperCard users managing large databases, word-processing files, or non-Mac file transfers. If your needs entail strictly text export, however, you may find the text-export utility in Claris' HyperCard Power Tools stack satisfactory. The Power Tools stack exports all background fields into a text file. As a third option, the HyperTalk language offers fairly straightforward import and export commands.

The Bottom Line

One of the benefits of using a popular programming environment such as HyperCard is the proliferation of utility programs available for enhancing its functions. Although many utilities are currently available in the public domain or as shareware, commercial products such as HyperBundle and Peacock offer special talents unavailable through shareware or HyperCard itself. The availability of products such as these keeps HyperCard accessible even to users who aren't ordinarily programmers. As all good programmers know, the best way to save development time is to use something that someone else has already created. If you need those special talents, HyperBundle and Peacock are well worth their cost.

— Scott Kronick

Get Info

HyperBundle

★★★½

Published by: Hyperpress Publishing Corp., P.O. Box 8243, Foster City, CA 94404; (800) 633-4252 or (415) 345-4620.
Version: 2.0.
List Price: $249; introductory offer, $134.50.

Peacock

★★★★

Published by: Cyan, P.O. Box 28096, Spokane, WA 99228; (509) 238-6789.
Version: 2.0.
List Price: $69.

DESKTOP PUBLISHING

FontMonger and Metamorphosis Professional

Two font-conversion programs can take PostScript Type 1 fonts to TrueType format and back again.

If you've invested in a library of PostScript Type 1 fonts, you may be understandably reluctant to purchase typefaces in Apple's new TrueType format. An economical alternative is a font-conversion utility, which can convert typefaces among the PostScript Type 1, PostScript Type 3, and TrueType formats.

Ares Software's FontMonger and Altsys' Metamorphosis Professional perform such font conversions, including full hinting for Type 1 and TrueType faces and preserving font-family relationships. Both System 7-compatible programs also create editable character outlines in EPS or PICT formats.

FontMonger is a robust font tool with a slender price tag whose real strength lies in font alteration, and Metamorphosis Professional is a dedicated conversion utility that's ideal for users with heavy-duty font-conversion needs.

FontMonger

FontMonger includes four built-in font alterations: small caps, inferior, superior, and slant. You can also add custom alterations such as slanted small caps. Double-clicking on a character brings up the Alter Character dialog box, which lets you adjust a character's height, width, and/or slant.

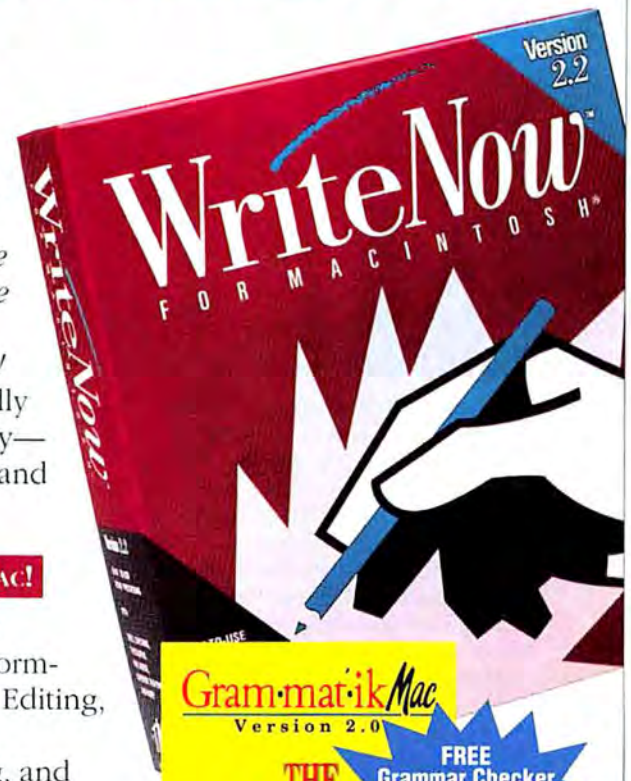
To create composite characters, including horizontal and diagonal fractions, you must type in the desired components in a dialog box. The ability to create fractions is a real boon, although you have to construct them individually.

FontMonger lets you copy and paste characters within a font or combine

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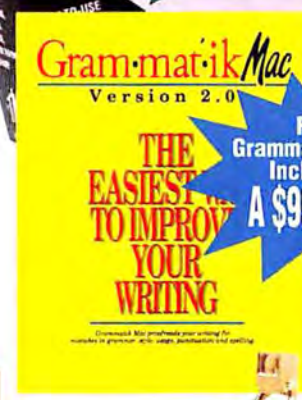
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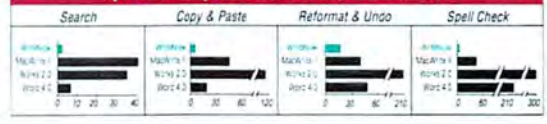
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Spell Checker (Size in words):	135,000	100,000	60,000	130,000
Grammar Checker (Bundled):	Yes	No	No	No
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Speed Comparison Charts (in seconds)



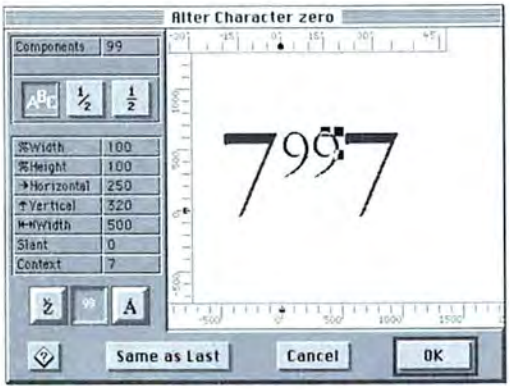
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CIRCLE 87 ON READER SERVICE CARD.



One of FontMonger's best features is its Alter Character dialog box, which lets you adjust characters by typing in numbers or moving elements. Here, a composite character is under construction, with 7 being used for context.

characters from different fonts. The latter capability is extremely useful if you frequently need a few characters from Zapf Dingbats, for example. You can assign specific characters to keyboard positions, and you can import black-and-white EPS graphics (such as logos) and assign them to keys. But be forewarned: Imported artwork can contain only black fills or outlines, not strokes.

After you've manipulated a font, you can save it in its original format or convert it to a different one (from Type 1 to TrueType, for example). For changing the format of several fonts at once, FontMonger has a Convert Batch option. Unfortunately, the batch-conversion process is clunky and confusing, a marked contrast to the program's other well-designed dialog boxes.

Instead of treating each font within a suitcase as a single entity, FontMonger sees each font as a family. For example, open the Bernhard Modern Roman font, and you see four font-family members: roman, bold, italic, and bold italic. Each style is also a separate font within the suitcase. For a basic four-style family, you generally convert the styles from the roman (or plain) font. Typefaces with more weights (such as Minion or Stone Sans) must be converted as several families. This process is incredibly confusing, and very little of it is explained in FontMonger's manual, which is woefully incomplete. The program does have context-sensitive help and technical support is excellent, which is partial compensation.

FontMonger can also export font characters as editable outlines, in either PostScript or PICT format. FontMonger's PostScript outlines are faithful renditions of the original characters. The program does an abysmal job of converting PICT characters, however, and frequently produces character shapes that are unusable, because of their severe distortions and an overwhelming number of control points.

How to be social.

Think how much more effective your people would be if they could communicate better. That's the idea behind WordPerfect Office™ 3.0 for the Macintosh.

It's actually several programs in one. WordPerfect Office comes with a very versatile E-mail package (WordPerfect Office Mail™), that makes it easy for people on a Macintosh network to keep in touch. The mail screen shows you everything you need to compose and circulate messages to an individual, to a group, or to the entire corporation.

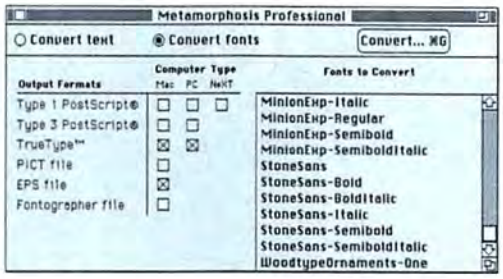
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Metamorphosis Professional

Metamorphosis Professional is a substantial upgrade to Metamorphosis, the Mac's first font-conversion utility. This version is an industrial-strength converter, capable of converting fonts among all Mac formats. The software also produces PostScript fonts for the PC and NeXT platforms, TrueType for the PC, and font databases for use in Fontographer (Altsys' font-creation program).



Metamorphosis Professional is an industrial-strength font converter with a simple, intuitive interface. In a single session, you can convert an entire typeface library into one or more font formats for the Mac, PC, and NeXT platforms.

All the program's operations occur in a single window that has two modes, Convert Text and Convert Font. Compared with FontMonger's, Metamorphosis Pro's font-conversion dialog box is a model of streamlined simplicity. You simply open font suitcases or Fontographer font databases, add typefaces to the batch-conversion list (Bernhard Modern Roman is a single font here), choose the output format(s), and click on the Convert button. Metamorphosis Professional asks where you want to store the converted fonts (there's a handy New Folder button) and begins processing fonts. You can convert fonts into multiple formats in a single conversion operation, and the program can locate and convert PostScript fonts no matter where they're located — even if they're inside a PostScript printer's ROM.

Metamorphosis Professional normally creates one suitcase for each four-font family, but you can also create a separate suitcase for each font (handy if you use Adobe Type Reunion). For those who prefer a nontraditional font family, a bundled utility called Style Merger lets you merge four styles of a typeface into a single family. Metamorphosis Professional provides some control over its automatic hinting process, particularly for conversions to TrueType. For Type 1 conversions, you can only turn hinting on or off; for TrueType, however, you can independently select vertical/horizontal hints, diagonal hints, and three degrees of dropout control.

Despite Metamorphosis Professional's single-minded focus on font conversions, we experienced a few problems. The program doesn't generate bit-mapped fonts during TrueType-to-Type-1 conversions, so if your TrueType originals didn't come with bit maps, you wind up with Type 1

How to get a date.

Of course, open communication is only one of many ways to bring people together. That's why WordPerfect Office 3.0 for the Macintosh also offers an integrated calendar and network scheduler to help you make appointments, coordinate meetings, schedule events and company resources as well as make to-do lists.

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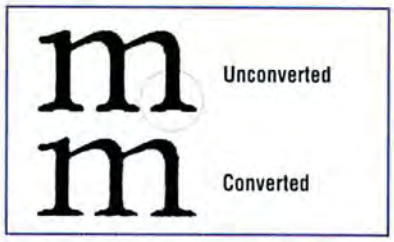


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CIRCLE 90 ON READER SERVICE CARD.



Both FontMonger and Metamorphosis Professional produce faithful renditions when converting PostScript fonts to TrueType format. There are occasional irregularities, however, such as the loss of the cupped serifs in this Bernhard Modern font converted by FontMonger.

printer fonts and no way to install or use them. Because most vendors, including Bitstream and Monotype, are shipping TrueType fonts without bit maps, this is a major problem that requires fast fixing. We discovered that converting fonts in Adobe's Expert series confounded the program: A TrueType version of Minion Expert was missing more than half the character set, including fractions, superscripts, subscripts, and special characters.

Metamorphosis Professional can convert font characters into EPS or PICT outlines. However, it offers more control than FontMonger does over which characters are converted. It can create outlines for characters that FontMonger misses, such as fractions. Metamorphosis' EPS outlines closely match those of FontMonger, with a similar number of control points, but its PICT-conversion process is vastly superior.

The Bottom Line

Both FontMonger and Metamorphosis Professional produce surprisingly good conversions, although converted fonts never look quite as good as the originals, either on-screen or on paper. Changes in character appearance were particularly noticeable at small point sizes on 300-dpi output. Metamorphosis Professional did a somewhat better job of preserving a font's character shapes and overall "color." FontMonger's TrueType conversions often looked lighter than the originals, and the program sometimes removed character features (the cupped serifs on Bernhard Modern, for example).

In addition, the leading and font widths of the converted fonts in both programs rarely matched their originals, causing document lengths and line breaks to change. Some of the changes are caused by differences in the Type 1 and TrueType formats, but FontMonger is also guilty of overleading its fonts, a problem that's magnified by the auto-leading in Word. When test pages were printed from PageMaker, however, both programs' TrueType fonts had leading and character spacing that were nearly identical to those of the Type 1 originals.

For those who need a Swiss-army knife for fonts, FontMonger delivers an unbeatable combination of price and features. It produces good-looking font alterations with a minimum of effort, but it's hampered by an awkward conversion interface and an inadequate manual. Metamorphosis Professional is the program of choice

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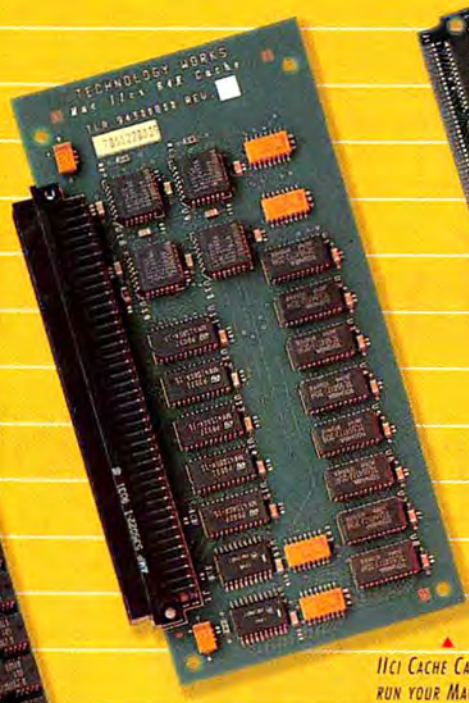
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FontMonger

★★★★

Published by: Ares Software, 561 Pilgrim Drive, Suite D, Foster City, CA 94404; (415) 578-9090.
Version: 1.0.3.
List Price: $99.95.

Metamorphosis Professional

★★★★

Published by: Altsys, 269 W. Renner Road, Richardson, TX 75080; (214) 680-2060.
Version: 2.01.
List Price: $149; upgrade, $45.

WORD PROCESSING

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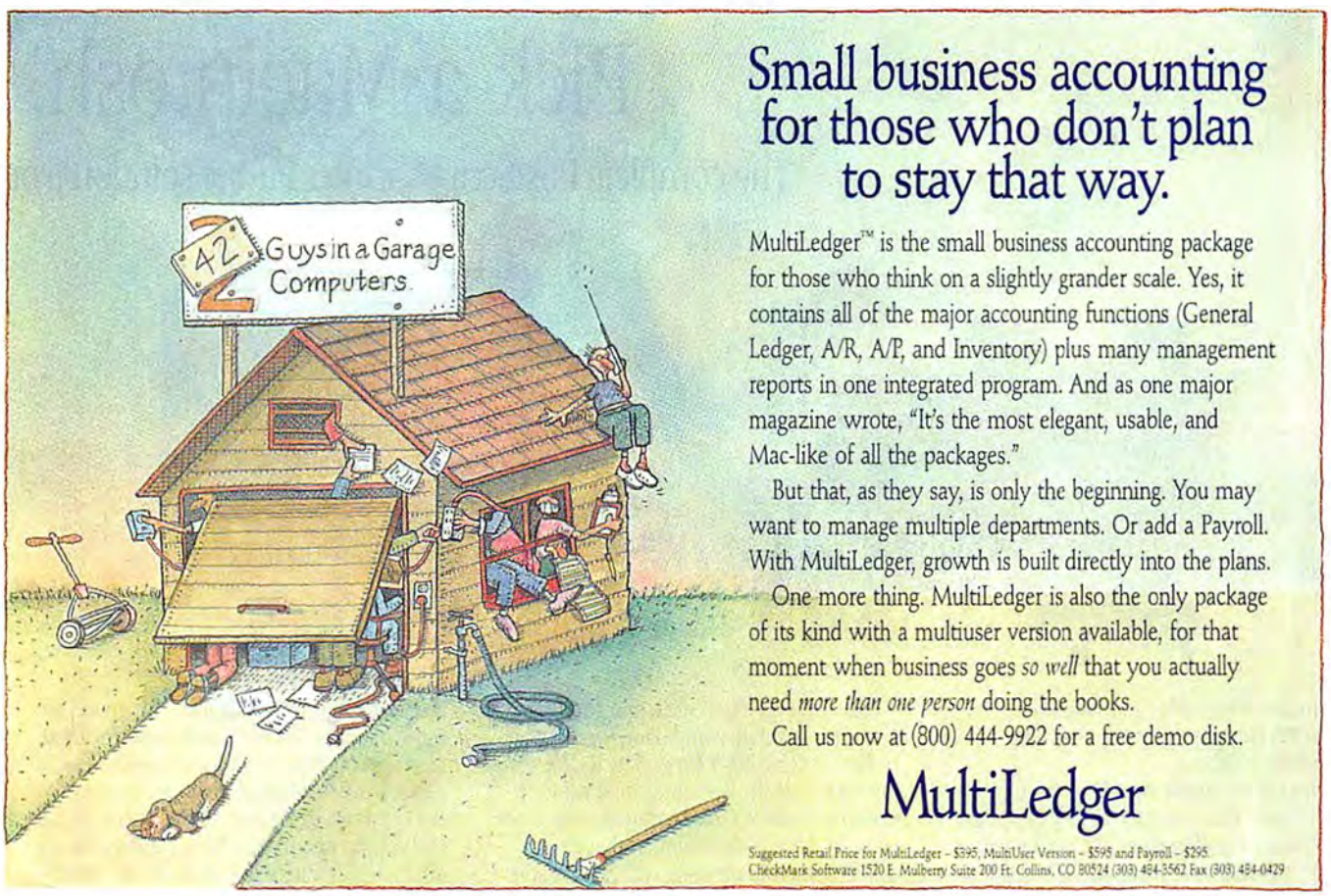
Creating properly formatted mathematical equations and scientific expressions is challenging, even with the help of a Mac. MathWriter 2.0, a full-featured word processor that's integrated with a specialized set of mathematical-writing tools, addresses that challenge.

Mixing Words and Equations

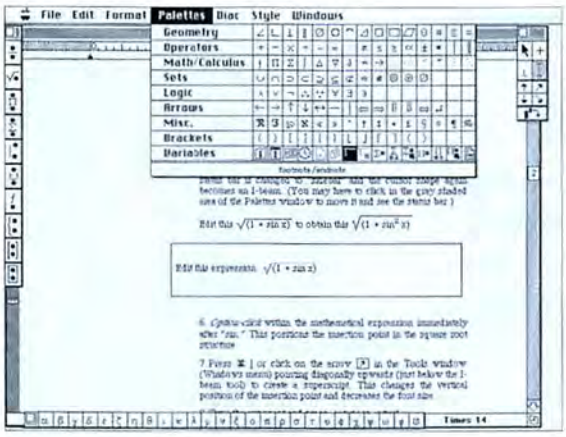
Current alternatives to MathWriter are such equation-writing utilities as Expressionist or MathType. After you've created an equation with these programs, you must paste the results into a word-processing document as a graphic. Mathematical expressions created in MathWriter, on the other hand, already exist as actual text in a document and can be edited directly in the document. A decidedly less attractive alternative to MathWriter also exists in the form of word processors such as Microsoft Word that supply built-in equation-writing capabilities. MathWriter's mathematical functions are significantly easier to use.

Aside from its mathematical writing abilities, MathWriter's features are competitive with those of high-end packages as a general-purpose word processor. Its talents include column formatting, table formatting, and border drawing. In addition, it provides style sheets, a search-and-replace function based on any style attribute, a revision-tracking feature (similar to the one in DocuComp), pop-up memo notes, sidebars, a spelling checker, and a thesaurus.

Before you begin to consider replacing



CIRCLE 135 ON READER SERVICE CARD.



MathWriter is a mathematical-equation writer combined with a full-featured word processor. Although you can create and edit mathematical equations from within your word-processing documents, MathWriter's tools are not as effective as they could be.

your word processor with MathWriter for all your technical documents, be forewarned. With all the specialized overhead devoted to mathematical-expression processing, you won't want to use MathWriter to dash off a memo or write a business letter. Two of the program's menu items are devoted to mathematical operations, as are many functions in the remaining menus. Line-spacing decisions require a separate dialog box in order to accommodate the complexities of equation formatting. There are three palette windows for accessing mathematical functions and symbols.

In addition, perhaps as a result of MathWriter's mathematical-formatting emphasis, the implementation of some nonmathematical functions is decidedly clumsy. For example, to create a footnote, you must select the correct option from 15 choices in the Variables row of the nine-row Palettes menu. Changing footnote formatting requires that you locate the correct option in another daunting scrolling list of options. MathWriter also has a Library function that uses an entire submenu and several commands, yet it accomplishes little more than the Glossary function in programs such as Word.

In the end, the success of MathWriter boils down to whether its advantages as an integrated word processor and equation writer outweigh those of a general word processor combined with an equation-processing DA. The answer for most users is probably not.

MathWriter's primary advantage is that it allows direct editing of equations within a document while providing true WYSIWYG formatting that doesn't require any special commands or codes. MathWriter also offers a convenient way to move between the subscript and the

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superscript levels. Its intelligent auto-formatting feature correctly adjusts spacing, font size, and italics for most equations. It can also automatically number sequential equations within a document. And last but not least, it offers a rich range of easily accessible mathematical symbols and functions.

Editing Snafus

Unfortunately, however, MathWriter's equation processing comes up short in some important areas. Most significantly, its editing capabilities are limited. Simple changes, such as adding denominators to existing expressions, require you to delete the entire expression and start over. In contrast, the Expressionist equation-writing utility accomplishes this task easily with a single mouse click. Other functions in MathWriter, such as adding auto-sized brackets, often require many more mouse clicks and menu selections than seem necessary. Cutting and pasting equations occasionally results in a loss of formatting, and in some cases we lost an entire section of the equation. As a result, we found that creating and editing equations was far less convenient in MathWriter than it was in Expressionist.

MathWriter was also slow at updating screens. Editing documents that contained several mathematical expressions resulted in frustratingly slow screen redraws, even with a Mac IIci. It was even necessary to occasionally scroll the current screen out of view and back again in order to update the screen correctly.

MathWriter's two versions, professional and educational, are nearly identical, except that several features are omitted or restricted in the educational version. These features include the Thesaurus, the Library, Memo notes, and Sidebars. The educational version is, of course, significantly less expensive, but it is the required version for 68000-family machines.

The Bottom Line

MathWriter turns out to be somewhat less than the sum of its parts. Although it's a general-purpose word processor as well as an equation processor, it does neither function well enough to make it an attractive alternative to other products on the market.

Most users who require mathematical processing will likely find better value and performance by combining an equation-writing utility with their current word processor.

— Ted Landau

Get Info

MathWriter

★★½

Published by: Brooks/Cole Publishing Co., 511 Forest Lodge Road, Pacific Grove, CA 93950; (408) 373-0728.
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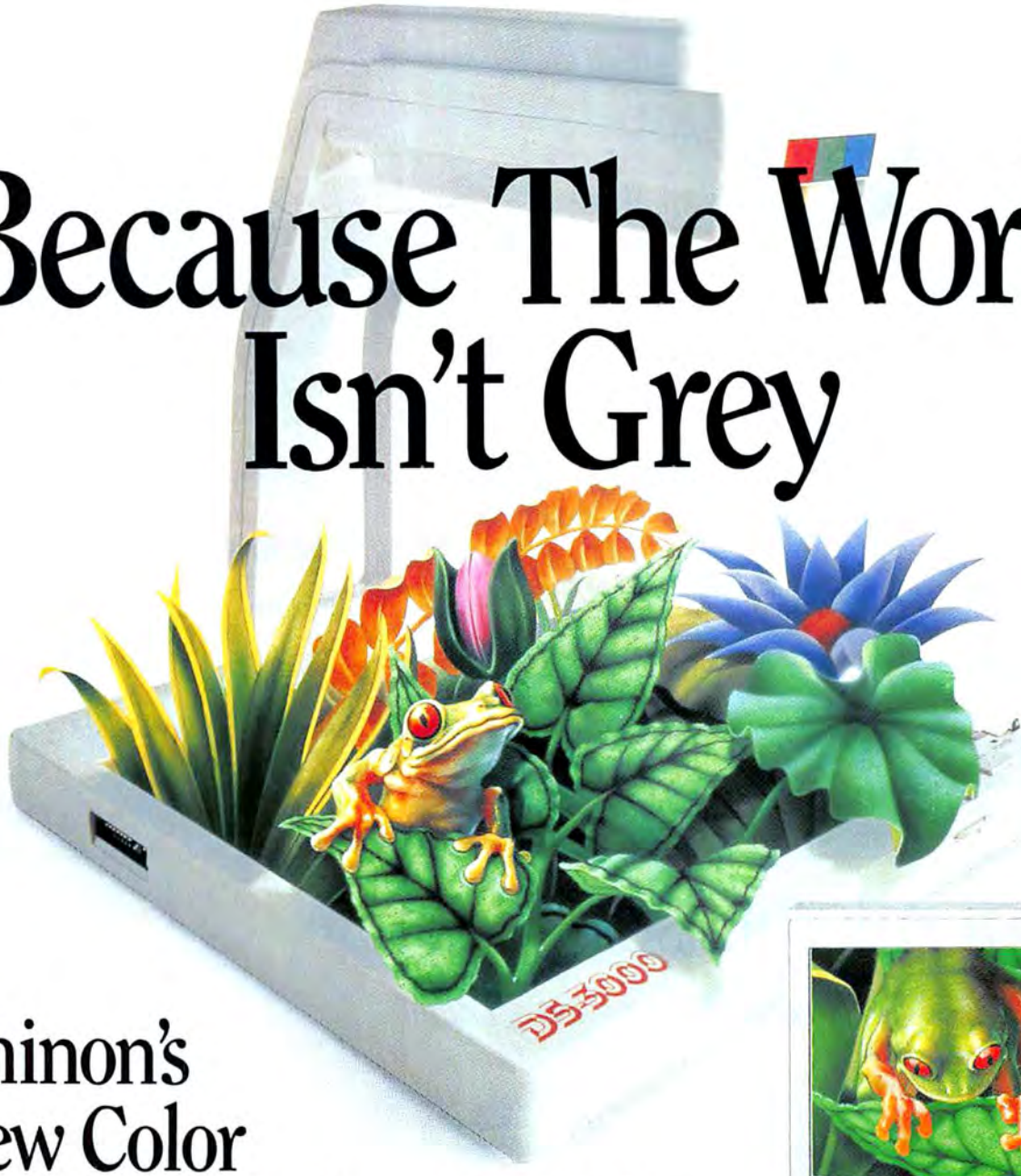
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QUICK CLICKS



DiskTwin

★★★★½

You're at work, and the clock is about to strike midnight. As you prepare to back up your 1-gigabyte hard-disk drive, a flash of lightning and a crash of thunder startle you. You jump and accidentally knock the drive off your desk. As it falls to the floor, your own scream wakes you.

Maybe your backup nightmares aren't this bad, but if they are, we prescribe a dose of DiskTwin, from Golden Triangle. DiskTwin is available either as a NuBus or as a PDS (processor-direct slot) card, with software, for IIsi's, SE/30s, and NuBus machines that provides a special SCSI port. Your primary hard drive plugs in to the standard DB-25 SCSI connector on the back of a Mac. You plug an identical or larger drive, destined to become a twin of the primary drive, in to the DiskTwin SCSI connector. Using the DiskTwin control panel, you then create a link between the two drives, and DiskTwin matches the drives according to their SCSI IDs.

Activating the link causes the contents of a primary drive to be copied to its twin drive, an operation Golden Triangle calls synchronizing. Henceforth, any operation that writes data to a primary drive is duplicated on its twin. No more cold sweats in the middle of the night — your data is backed up the moment it's written. An important item to note about DiskTwin is that it does not slow the computer down. The hardware operates independently of the Mac's built-in SCSI.

But don't run out and buy DiskTwin if you believe that it can protect your data from every problem. DiskTwin protects you from hardware problems only in your primary drives. It cannot shield you from viruses, power surges, or pilot error. For example, if someone throws all your files into the Trash, all the files on the twin drive will also be thrown into the Trash (DiskTwin is an obedient servant).

To protect yourself against theft or acts of God, use a removable-cartridge drive for your twin. This way you can use two cartridges, resynchronizing the older cartridge and taking the current one home for off-site backup.

You also won't be protected from software bombs that take the hard disk with them. Get the idea? The point with DiskTwin is that when you do have a hardware crash (bad block, head crash, controller or power-supply failure), DiskTwin senses the loss of the primary drive and automatically switches over to the twin without a hiccup. You can set DiskTwin either to alert you with a dialog box when something goes wrong or to politely send you an E-mail message if you're on Microsoft Mail (Golden Triangle is developing a CE Software QuickMail notification that should be available soon).

A companion software product, PartitionTwin, is included in the DiskTwin package. PartitionTwin uses the same hardware but lets you back up multiple partitions from multiple drives to a single twin drive. This way you can keep only important data backed up, so you don't have to have a twin drive that exactly matches the size of your primary drive.

DiskTwin is easy to install and set up, and it's also fast and absolutely transparent in operation. Thank goodness, because we can't afford to lose any more sleep.

Golden Triangle Computers, Inc., 4849 Ronson Court, San Diego, CA 92111; (619) 279-2100. Version 2.0. $995.

— Ron Hipschman



Easy Color Paint

★★★★

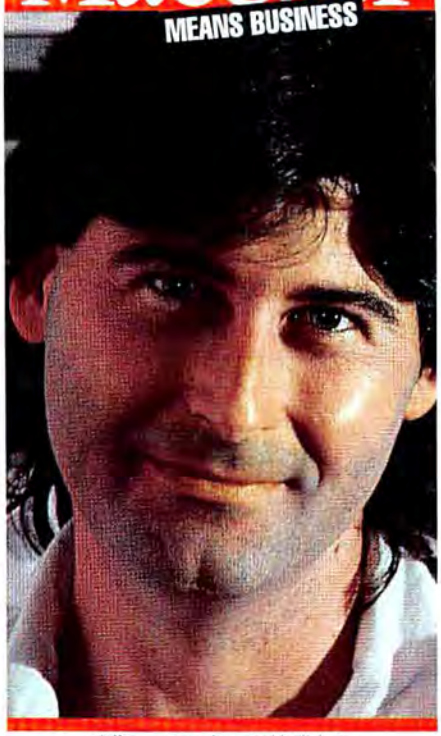
Easy Color Paint is exactly what it claims to be: an inexpensive 8-bit (256 color) painting program that operates with the simplicity of our old friend MacPaint. Although Easy Color Paint lacks some of the high-end features (and the price tag) of programs such as Studio/8, it has enough little tricks — such as user-editable colors and patterns, coloring modes (how one color applied over another affects the blend), color printing on the ImageWriter and color QuickDraw printers, support for the WACOM line of pressure-sensitive tablets, and gradient fills — to bring out the digital Degas in all of us.

You can configure Easy Color Paint to suit your artistic capabilities. Children can double-click on the Junior Preference file to bring up a 16-color palette with locked windows. Or you might slap on a beret and try Artist, where all 256 colors are displayed at once and you can access a limited variety of special effects. You can customize your favorite options and save them in their own Preference file.

Creative Software's program is more than a colorized version of MacPaint. Yes,



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QUICK CLICKS

you'll feel right at home with the MacPaint-like tools, but a closer look at Easy Color Paint reveals some special enhancements. Most tools produce their own menus when you select them. The Lasso menu, for example, supplies blend options for selected regions as well as a choice between a tight lasso and a loose one. To match colors, you can hold down Shift-Option to reveal an eyedropper tool. The space-conscious can remove the title bar and invoke Skinny Tools, a slender tool palette that fits neatly along the left side of your screen. You can also remove scroll bars to gain even more painting area (simply Shift-Option-drag at the corner and sides to move window boundaries).

Easy Color Paint comes with a few minor annoyances. When you're working in Fatbits, you can use only the pencil tool. Also, the painting size is determined when you launch the application, which causes any painting larger than the size you initially set to be cut off (you select where) and the cropped portions to become inaccessible. To view and edit the larger painting, you must quit, relaunch, and specify new dimensions for the painting window.

In a more expensive program, these complaints would be more than minor, but let's face it: Easy Color Paint is cheap, cheap, cheap. And not only that — it's also fast, reliable, and fun to use. If you need a bargain-priced set of electronic crayons around the home or office, Easy Color Paint is hard to beat.

Creative Software, 3213 Annandale Road, Durham, NC 27705; (800) 367-6899 or (919) 493-9503. Version 2.003. $89.

— Christopher Breen



FlexiTrace ★★★★½



digiMatic ★★★★½

Plenty of programs turn numbers into graphs and charts, but two programs turn the tables by turning graphs into numbers. Tree Star's FlexiTrace and digiMatic, from Famous Engineer Brand Software, help you retrieve numerical data from charts by digitizing the graphics, and they do so with surprising accuracy. You can save the extracted data in tab-delimited format for use in other programs.

FlexiTrace automates the process of digitizing line, column, area, and scatter charts. All you have to do is prepare the graph for digitizing. To do this, you first scan your graph, if it's on paper, or cut and paste it into FlexiTrace from another application (FlexiTrace reads PICT files).

The key to getting accurate results with FlexiTrace is to make sure that the chart is aligned correctly with the screen. This is a simple task with FlexiTrace's Plumb Bob tool. You simply draw a vertical line down the *y*-axis of a graph with the tool, and the program rotates the graph until the line is positioned correctly.

Next, with a dimension tool, you drag-define the area that you want digitized. A dialog box lets you enter the numerical *x* and *y* coordinates of the specified area. You can also specify the number of evenly spaced *x*-axis samples or minimum and maximum values along a curve.

You must now clean your chart to get rid of all extraneous labels, grid lines, and miscellaneous garbage. FlexiTrace provides a noise filter that erases lonely pixels, a grid filter that erases horizontal and vertical lines, and a spike filter that smooths curves.

Once your chart is clean, FlexiTrace goes about tracing it, mapping data points automatically. The resulting data is placed in a window that lets you see and edit the numbers. Saving this window creates a standard tab-delimited text file that virtually any spreadsheet, charting, or data-analysis program can read.

FlexiTrace also provides tools for measuring the distance between points (with the ruler tool), the slope of a traced line (with the protractor tool), and the area enclosed by the lasso tool (with a menu choice). You can digitize individual points by clicking on them with the ruler tool.

In contrast to FlexiTrace, digiMatic is a DA that's designed to work with other programs. Consequently, you must use another application to open the graph you want digitized. digiMatic's maker claims that you can also tape a transparency of a chart to the screen and digitize it against a white background, or you can use a digitizing tablet. digiMatic doesn't provide tools for cleaning your graph prior to digitizing, but any painting program can do the job.

The process of turning your graph into numbers is simple, although unlike with FlexiTrace, it's not automatic. Once your graph has been displayed, you set the *x* and *y* scaling by clicking on and entering the

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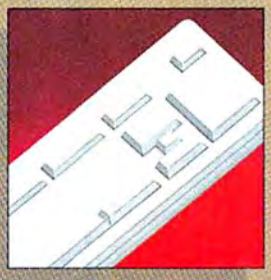
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maximum values for both axes. You can specify that the axes be linear or logarithmic. You can also digitize by using screen coordinates.

If your graph is skewed on the screen, you can click on the origin of the graph and the program will mathematically unskew the points. Click on the Record button, and click away at the chart to your heart's content. digiMatic records the scaled coordinates of every click. The program also displays the coordinates of the cursor. You can click on the Play button, and digiMatic will draw your axes and chart (line, column, or scatter) on-screen so you can verify your points before you complete the digitizing process.

Once digiMatic has come up with numerical values for the points you've defined, you can edit the values and save them as a tab-delimited file.

If you don't need to digitize many points per chart, digiMatic is faster and easier to use than FlexiTrace. On the other hand, if you do need to digitize many points, FlexiTrace, with its automated process and extra tools, is a better choice.

Famous Engineer Brand Software, 4855 Finlay Street, Richmond, VA 23231; (804) 222-2215. Version 1.02. $249.

Tree Star, Inc., 116 Memory Lane, Campbell, CA 95008; (800) 366-6045 or (408) 371-8343. Version 1.01. $249.

— Ron Hipschman



MacEKG

$3\frac{1}{2}$

Aimed at power users and computer-repair specialists, MacEKG is an INIT that administers a suite of diagnostic tests to the Mac on startup. The program compares current system performance with a log of previous test results, pinpointing significant changes that are symptomatic of underlying viruses, misbehaving INITs, and other problems.

MacEKG can't define specific causes of performance degradation or operate on physically defective hardware. Its primary role is to alert you to symptoms, not to provide a diagnosis. Once MacEKG has identified a problem, it refers you to the package's well-written documentation for possible explanations.

After all your other INITs are loaded, MacEKG performs 35 benchmark tests on the Mac's logic-board operation, SCSI performance, and QuickDraw speed. Parameters such as processor type, RAM amount, ROM revision, heap size, and boot-block information are displayed and logged to disk. Once the tests have been completed, a digitized voice announces the results. MacEKG removes itself from memory, and the Finder appears.

Using a control panel, you can specify MacEKG options such as the frequency of tests (for example, every startup, daily, or weekly) and the type and volume of voice alerts. More importantly, you can analyze your Mac's performance over time by viewing the test-result logs. Results are for historical reference only and can't be used to compare one system with another. Three logs cover general system parameters, SCSI-drive information, and performance-benchmark-test results. You can view the alphanumerical data or export the logs for further analysis in other applications.

With its companion utility, Restarter, MacEKG can quickly run many tests on an unattended machine. Whenever MacEKG completes its diagnostics, Restarter initiates the startup process again for another iteration of all the tests. This feature is particularly useful for service technicians attempting to diagnose Macintoshes with intermittent problems. Computer resellers and peripheral manufacturers can also use this feature as a quality-control measure to break in equipment prior to shipment.

Currently, most of MacEKG's functions can be emulated, albeit incompletely, by Ken McLeod's MacEnvy (public domain) and Scott Berfield's Speedometer (shareware, $25). However, by the time you read this, MicroMat intends to have bundled Periscope with MacEKG. Periscope is a utility that graphs MacEKG data and makes it easy to correlate performance deviations with milestones such as installing a new INIT or removing an accelerator. Using MacEKG in conjunction with Periscope will make it much easier to accurately diagnose the root of performance problems once MacEKG has flagged them. If Periscope lives up to its advance billing, the team of MacEKG and Periscope will be an indispensable addition to every power user's hard disk. In its 1.0 version, however, MacEKG's appeal is limited primarily to knowledgeable service personnel.

MicroMat Computer Systems, 7075 Redwood Blvd., Novato, CA 94947; (415) 898-6227. Version 1.0. Single-user version, $99; site licenses available (call for pricing).

— Owen W. Linzmayer

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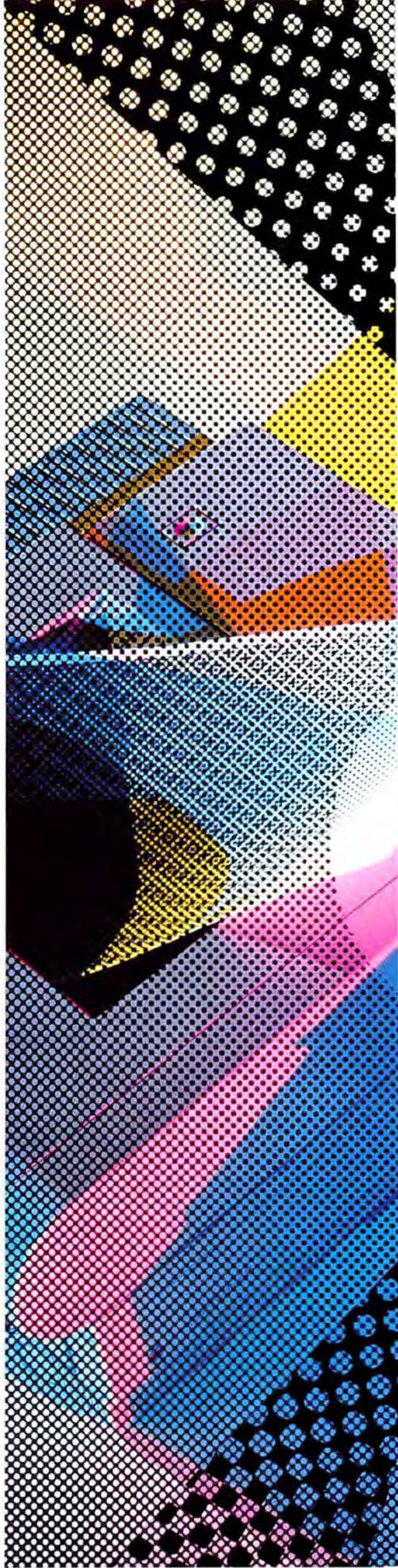
BY HENRY BORTMAN

The phone rings. "We want to tell you about two new printers and a scanner," Kathy, an Apple spokesperson, says over the phone.

Two new printers, I muse. Apple's about due for some new entries on the high end; they're probably PostScript Level 2, have a 68030 chip on the controller, and maybe include Ethernet connectivity. Could be interesting. But another scanner?

I go for the jugular. "So tell me about the scanner. No. Let me guess. It has the most incredible software ever. It's so easy to use that everyone will want one the day it ships. Don't you people ever learn? The only software you need is a Photoshop plug-in. It does come with a Photoshop plug-in, doesn't it?"

"Well, no . . . ," Kathy confesses.



PHOTOGRAPHY: PIERRE-YVES GOAVEC



My fingers take on a life of their own and start tapping on my desk in six-eight time.

"We concentrated on making scanning easy," she continues. "If we could show you true one-button scanning — software that would guarantee you an image that matches your original, on any printer, at any resolution, automatically — what would you think?"

"I'll try to keep an open mind," I reply. "So when do you want to show me the printers?"

"Two printers *and a scanner,*" Kathy reminds me.

Since Apple launched the desktop-publishing era with its 1985 introduction of the LaserWriter, it has consistently pushed the high-end envelope for desktop printing even higher. Now it has done it again with the LaserWriter IIg. There is also the LaserWriter IIf. The IINT and IINTX will be discontinued. Here are the results of MacUser Labs' first look at beta units of these two new printers . . . and a scanner.

Two Printers . . .

The LaserWriter IIf and the LaserWriter IIg are Adobe PostScript Level 2 printers. Each is powered by a 68030 chip — the IIg's 68030 runs at 25 megahertz, and the IIf's runs at 20 megahertz. The IIg comes with 5 megabytes of RAM, which is upgradable to 32 megabytes (with 4-megabyte SIMMs); the IIf comes with 2 megabytes of RAM and is also upgradable to 32 megabytes. Each provides a SCSI port for attaching a font disk, and each incorporates two new Apple technologies — FinePrint and PhotoGrade — to improve print quality (see the "FinePrint and PhotoGrade" sidebar for details). (The IIf requires a 4-megabyte RAM upgrade to use PhotoGrade.)

The IIg provides an Apple EtherTalk port, for connection to EtherTalk networks, as well as the standard LocalTalk port and serial port. With a feature Apple calls All Ports Active, the IIg can be connected simultaneously to a LocalTalk and an EtherTalk network as well as to a PC via the serial port, and it can switch automatically among jobs arriving at any of the three ports. The IIf can switch automatically between its LocalTalk port and its serial port. Neither printer offers automatic emulation switching between PostScript and HP PCL jobs, although the LaserWriter Font Utility that ships with the printers does allow switching via software control — and there's always the button on the printer's front panel, which lets you do the same thing manually.

Each printer contains a built-in rasterizer for TrueType fonts, which means that your Mac doesn't have to download special software whenever you want to print TrueType fonts on Apple's PostScript printers. Both printers also come with TrueType versions of "the rest" of the 35 LaserWriter Plus fonts. System 7 includes TrueType equivalents for only the Times, Helvetica, Courier, and Symbol fonts. However, most PostScript printers also include Palatino, Bookman, New Century Schoolbook, Avant Garde, and the ever-exciting Helvetica Narrow — in TrueType

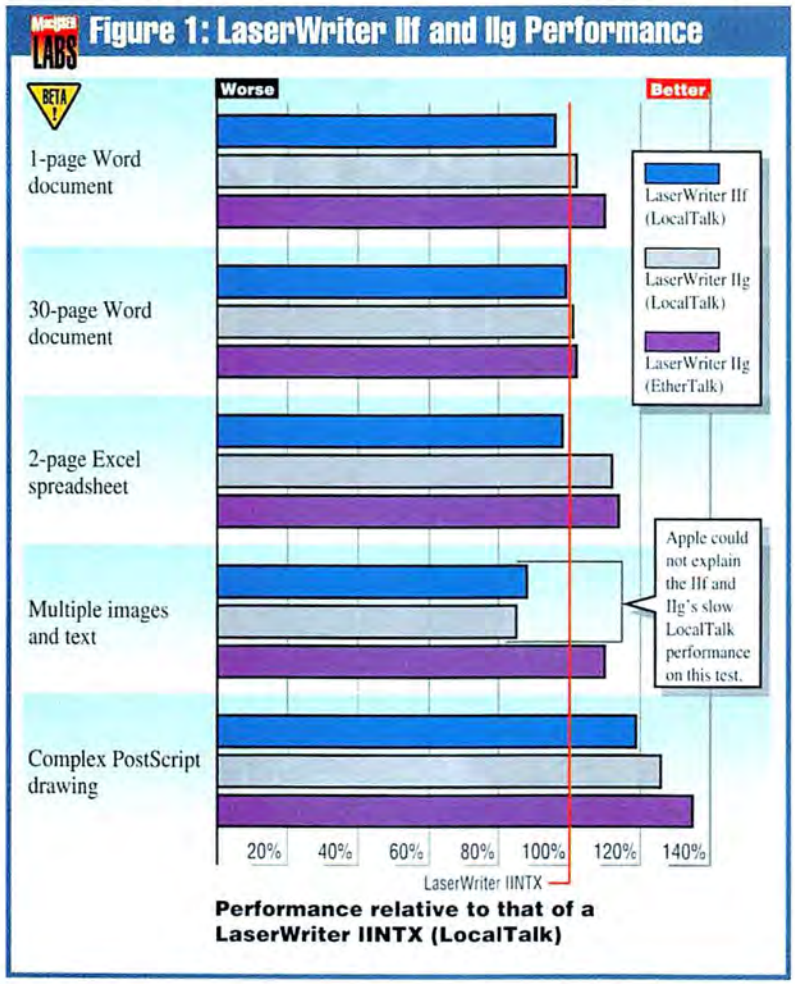


Figure 1: Apple's new LaserWriters deliver higher performance for the dollar than their predecessors did. When printing text-based documents, the IIf is only slightly slower than the old IINTX, but it costs $1,400 less. The IIg, which costs $400 less than the IINTX, prints Word and Excel documents somewhat faster than the IINTX does. Both the IIf and the IIg delivered stunning performance on PostScript-graphics-intensive files, but they were surprisingly slow in our test of printing multiple images and text.

format. (For the latest information on Apple, Adobe, and TrueType, see the "RIP TrueType?" sidebar.)

PhotoGrade is extremely impressive. Using the same Canon SX engine as in the IINT and the IINTX, Apple has doubled the LaserWriter II's default screen frequency from 53 to 106 lines per inch, which is squarely within the frequency range used in much of commercial printing. It has also increased the achievable shades of gray from 33 to 67, which is twice the number of gray shades that a 600-dpi printer can image at the same 106-line-per-inch frequency. PhotoGrade's magic is accomplished in 4 megabytes of RAM; a 600-dpi printer requires 8 megabytes to image the same page.

The results are stunning. One question that remained unanswered at press time was how well PhotoGrade images would reproduce on a commercial press. Take a look at Figure A for the answer.

FinePrint's text-smoothing effect is subtle. Although FinePrint output looks better than IINTX output, FinePrint doesn't improve text legibility at small point sizes. Xante's 600-dpi Accel-a-Writer controller does a better job with tiny type than does FinePrint, and Hewlett-Packard's RET (Resolution Enhancement Technology) on its IIISi outdoes both.

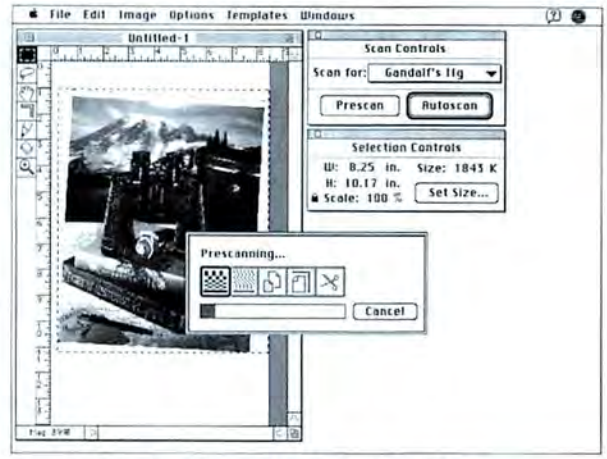


Figure 2: Ofoto, the software that ships with Apple's new OneScanner, automates the scanning process. Here, Ofoto has located the image on the scanner bed and has identified that the image is a continuous-tone photograph. Next, it will automatically rotate and crop the image. The Scan Controls dialog box lets the user select a calibrated printer to ensure that the printed image matches the original as closely as possible. The Selection Controls dialog box aids in cropping and resizing scans.

Surprising Speed

In our tests, the IIf clocked in slightly behind the former top-of-the-line printer, the IINTX, when printing text-intensive documents and was 20 to 25 percent faster when imaging graphics-intensive pages (see Figure 1). Even though it delivers IINTX performance, it lists for $3,599, which is $400 less than the price of the IINT.

Apple's new performance leader, the IIg, is also priced aggressively, at $4,599. This printer delivers a curiously mixed performance, though. When printing a 30-page Word document, it ran neck and neck with the IINTX — a disappointment. When printing a two-page Excel spreadsheet containing one chart on each page, it gained on the IINTX by roughly 15 percent. It shone most brightly on processor-intensive PostScript graphics (we used Illustrator for this test), beating the IINTX by 25 percent over a LocalTalk connection and by a whopping 35 percent over EtherTalk.

Yet in printing a page containing a large bit-mapped image and many different fonts, which required a lot of data to be shoveled across the network, the IIg on LocalTalk was 15 percent slower than the IINTX and slightly slower than even the IIf. This was as much of a mystery to Apple as it was to us. We offered several plausible theories, yet although Apple rejected all of ours, it couldn't come up with anything better. Because we used beta hardware and software, we can only attribute the problem to the prerelease nature of the equipment and assume that Apple will have addressed the issue by the time you read this.

Owners of previous LaserWriter printers (specifically, the IISC, IINT, and IINTX) are in luck. The IIf and IIg controller boards fit in the same LaserWriter II shell as their predecessors do. No muss, no fuss. Unscrew two thumbscrews, pull out the old controller board, insert the new one, and tighten the new thumbscrews. Your printer's upgraded. The upgrade prices are as aggressive as the printer prices: $1,399 for the IIf upgrade board and $2,399 for the IIg upgrade board.



Figure 3: If Ofoto doesn't align an image correctly when it rotates it automatically or if you want to rotate the image to another angle, you can use the rotation tool to put a grid on-screen and drag the image to the desired rotation angle.

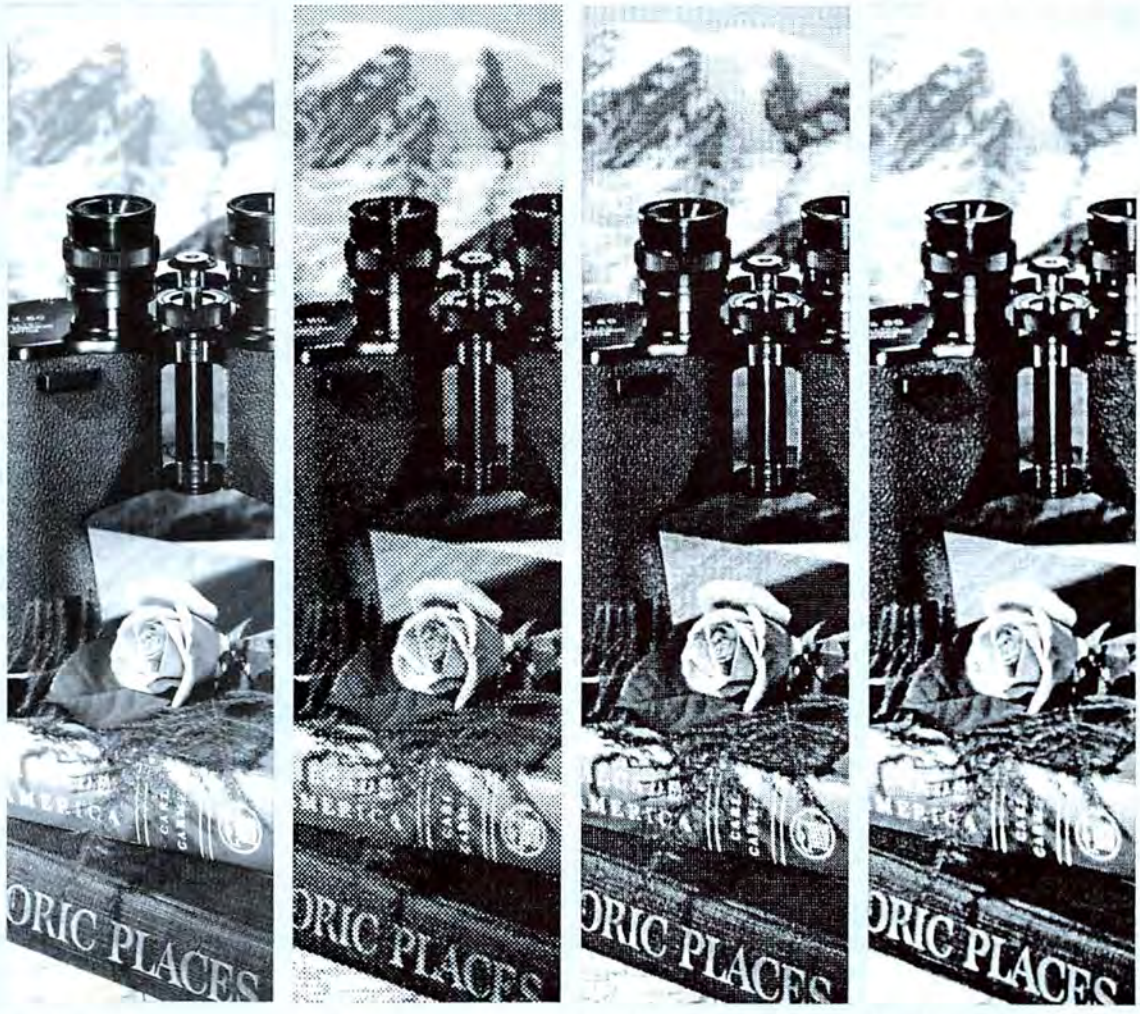
And for those of you who've been waiting and waiting for PostScript Level 2 printers, the wait is over. The trouble is — for now, at least — their arrival won't do much for you.

FinePrint and PhotoGrade

FinePrint and PhotoGrade are Apple's solution to a nagging problem: 300-dpi printers come up short in producing two types of images. One type is text and black-and-white line art (text, after all, is really nothing more than a specialized form of line art). The other is gray-scale images (see Figure A). These two broad categories comprise 100 percent of a monochrome printer's output. At 300 dpi, there aren't enough dots to form crisp, smooth outlines for detailed text or line art. This is particularly evident when you examine text at small point sizes (see Figure B). Nor does a 300-x-300-dpi grid provide enough dots for good gray-scale images.

Gray-scale images are output on a monochrome printer by a method known as halftoning. On a laser printer, halftoning involves grouping individual dots into "cells" and varying the number of dots printed in the cells, which produces the illusion of differing shades of gray. For halftone images to look good, a printer needs to have enough dots to produce a relatively high number of cells per inch and to have a relatively high number of dots in each cell. But 300-dpi printers offer neither. They produce gray-scale images with a 53-line screen (53 cells per inch), which looks grainy, and they provide only 33 levels of gray, which can cause *banding* — noticeable sudden jumps in gray shading — in some images.

High-resolution imagesetters (1,200 to 3,000 dpi) have enough



Traditional halftone (133-line screen)

Apple LaserWriter IINTX (53-line screen)

Apple LaserWriter II with Xante Accel-a-Writer controller (85-line screen)

Apple LaserWriter IIg (106-line screen)

Figure A: PhotoGrade sets a new standard of quality for desktop-printed gray-scale images. Its results are remarkable. By increasing the screen frequency to 106 lines per inch and increasing the number of available gray shades to 67, the IIg with PhotoGrade can outimage not only a standard 300-dpi printer (the IINTX) but also a 600-dpi printer (the LaserWriter II with the Accel-a-Writer). PhotoGrade is standard on the IIg and is available with a 4-megabyte RAM upgrade on the IIf.

Figure B: Apple's FinePrint smooths the edges of black type (and line art) but doesn't make text more legible at small point sizes. Notice how the ampersand on both the IINTX (no FinePrint) and the IIg (with FinePrint) output is plugged up on top. Xante's 600-dpi controller for the LaserWriter II yields more-legible type, and HP's IIISi (with RET) does astonishingly well. The large ampersand in each case is 8-point type enlarged 400 percent.



Apple LaserWriter IINTX | **Apple LaserWriter IIg** | **Apple LaserWriter II with Xante Accel-a-Writer controller** | **Hewlett-Packard IIISi**

dots to increase both the screen frequency and the number of gray levels, and users today are looking for imagesetter quality on the desktop — at desktop prices. Unfortunately, it's not likely to happen any time soon, because current laser and toner technologies simply aren't capable of doing the job.

Some vendors, such as Xante, have developed print-engine controllers that squeeze higher resolution (600 dpi) out of the Canon SX laser engine, which typically outputs 300 dpi. Xante boards can be installed in the LaserWriter, the LaserWriter Plus, and the LaserWriter II. Other vendors, such as Varityper and NewGen, have built printers around high-resolution engines that are designed for 400-to-600-dpi output. And still others, such as Hewlett-Packard, with its RET (Resolution Enhancement Technology), stick to 300 dpi but alter the size of individual dots to achieve an effect that is similar to that of increased resolution. In addition, the HP IIISi uses a Canon SX Model P170 engine and a finer toner than that commonly used in 300-dpi printers.

Apple's solution also works by varying dot size, although in a different way from that of HP. PhotoGrade is a preprocessor that works with PostScript's halftoning technology. It operates on the gray-scale portions of the image, leaving the black-and-white areas alone and elongating or shortening certain dots to provide a significantly higher number of simulated gray shades.

FinePrint, a postprocessor that operates on a page's bit-mapped image after PostScript has rendered it, works on portions of the image in which black-and-white transitions occur, avoiding areas with intermediate gray shades. FinePrint also reshapes selected dots to fill in and smooth out the edges of type and line art (see Figure C). Both FinePrint and PhotoGrade are implemented in custom coprocessor chips on the IIf and IIg printer-controller boards, but PhotoGrade requires a 4-megabyte RAM upgrade to work on the IIf.

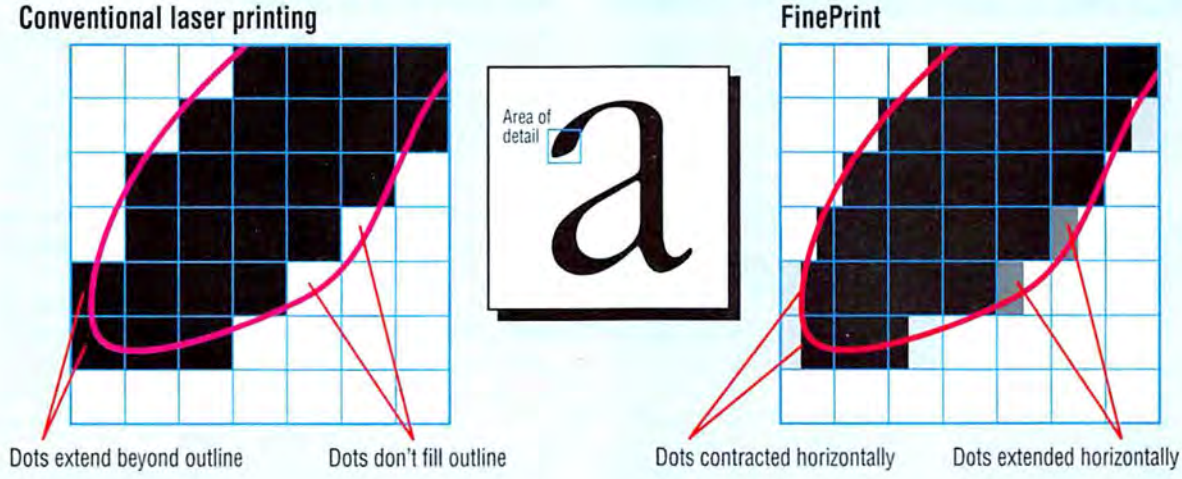


Figure C: In the sample on the left, which illustrates conventional laser-printing technology, some dots extend past the letter's outline. Other dots don't extend as far as the character's outline, producing white gaps. By contracting dots that stick out and extending dots that fall near white gaps, FinePrint can match the character's outline more closely. Because it can extend and contract dots in a horizontal direction only, however, FinePrint can't solve all text-smoothing problems.

Apple hasn't revved its LaserWriter printer driver to take advantage of any Level 2 features. Adobe's driver won't be available until close to the end of the year, and application developers aren't yet taking advantage of the ability of Level 2 printers to do such things as rasterize compressed images.

. . . And a Scanner

It's always difficult for a journalist to admit that a public-relations person is right. But when Kathy told me that Apple's new scanner would ship with the most incredible scanning software ever, she wasn't kidding. The scanner, known as the OneScanner ($1,299), is an 8-bit gray-scale scanner. Actually, it captures only 6 bits per pixel of usable data, but that's still a significant step up from the less-than-spectacular $1,799 4-bit scanner Apple has been peddling until now. What makes this package so impressive, however, isn't the scanner — it's Ofoto, the software that comes bundled with it.

Ofoto is so impressive, I'll even forgo nasty cracks about the name. Written by Robert Cook, of LightSource, whose previous accomplishments include Pixar's RenderMan, Ofoto lets users create quality scans with minimal effort. With Ofoto, one-button scanning has truly arrived.

It's important to make one thing clear about Ofoto: It is *not* an image-processing application. It doesn't provide 57 filters, a gray-scale-transfer curve-editing dialog box, and the like. Its goal is to produce an image that, when output on a specific printer, looks as much like the original as possible and to make the process of capturing that image as simple as possible. You still need Photoshop, ColorStudio, or Digital Darkroom for any image manipulation, but whether you start with a signed Ansel Adams original or a faded page from an old *Life* magazine, Ofoto will reproduce it faithfully.

RIP TrueType?

Apple may be putting the TrueType rasterizer into the LaserWriter IIf and IIg printers, but it will be putting Adobe's ATM technology into the Mac OS. A "future feature-enhanced release" of System 7 will incorporate Adobe's Type 1 font-rasterizing technology. Users will be able to use either TrueType or PostScript Type 1 outline fonts for Mac screen displays, without having to purchase ATM. The ATM technology will be available this fall as an upgrade package before it shows up later as an integral part of the Mac's system software. Too bad Adobe and Apple didn't do this in the first place and save us all a lot of headaches.

The upgrade and the future system software will include some Type 1 fonts, but no one's yet saying which fonts. Some other unanswered questions: What will the upgrade cost? How will it be distributed? Will users be able to drag Type 1 fonts into their System file the way they do bit-mapped and TrueType fonts now? Will Type 1 fonts still need bit maps? Will there be a new Type 1 font-file format (will users have to completely upgrade their Type 1 libraries)? Will the new software support Adobe's Multiple Master font technology? Will the new system software also include Adobe's printer driver for PostScript printers?

And, of course: Is this the end of TrueType? Apple says no. Adobe says no. We say we're not so sure.

Printer Calibration

The first step in this process is to calibrate the OneScanner to your printer or imagesetter. Ofoto comes with configurations for all of Apple's printers, a couple of HP's, the Linotronic 300, and a few others. These configurations contain information about what resolution and bit depth to scan at and so on. You can create custom calibrations, but Ofoto is designed to figure out all that nasty stuff for you and to keep it hidden unless you want to roll up your sleeves and get into it.

To calibrate the OneScanner for a specific printer, you have to print a gray-scale calibration page from Ofoto or from another application, such as PageMaker or QuarkXPress — whatever you will be using for your final output. You then scan the calibration page with the OneScanner and give the calibration setup a name, such as Gandalf's IIg. Note that this process *does not* include calibrating your monitor. You can, of course, use other software to do that. But Ofoto's emphasis is on original-to-printer fidelity. What you see *is* what you get, but what you see *on-screen* may not accurately reflect your final printed output.

After you've calibrated the scanner, there's really not much more you need to do than slap an image down on the scanner bed — don't worry about getting it exactly straight — and click on the Autoscan button. Ofoto does the rest (see Figure 2). It may sound as though I'm quoting Kathy's marketing hype, but believe me, it's true.

From Mouse Click to Halftone

The first thing Ofoto does is a quick prescan of your image. It looks for several things when it does this. First, it determines where the image is on the scanner bed (it even alerts you if you've forgotten to put an image there!). It decides whether the image is line art or gray scale. And if it's a gray-scale image, it figures out whether it's a continuous-tone image (an original photograph) or a halftone (an image that has been printed in a book or magazine) that requires rescreening.

Ofoto then does a high-resolution scan of only that portion of the scanner bed where it's ascertained that there is something worth scanning. You don't have to worry about whether to scan at 75, 150, or 300 dpi. Ofoto figures it out for you, based on the characteristics of the printer you've selected as the output device.

If your image is an already screened halftone, Ofoto will automatically scan at a high-enough resolution to *descreen* the image. This process gets rid of the dots in the halftone and eliminates the moiré patterns that often appear in halftone scanning. Descreening is a very difficult task, and most scanner software doesn't even attempt it. We tried

scanning an 85-line and a 110-line halftone image, and Ofoto did an excellent job of descreening both, with only minimal moiré on the 85-liner.

Then — this is my favorite part — Ofoto automatically *rotates* the image to get it straight. How does it know what straight is? It looks for a straight, nearly horizontal edge, either on the page in the scanner or within the image itself. As with all the other tasks Ofoto automates, if you don't like the way it does something — let's say it picks the wrong edge and rotates your image incorrectly — you can tweak it manually. But rather than making you guess whether you need to rotate it 12.3 degrees or 12.4 degrees and then making you enter your guess in a dialog box, Ofoto gives you a grid on-screen that you drag until it lines up with what you want to become a horizontal line in the image (see Figure 3). When you release the mouse button, the image rotates — fast.

Finally, Ofoto reexamines the image to see if there's a bunch of white space around the edge that it can crop off to save precious hard-disk space. Again, if you want to take matters into your own hands, there's a simple-to-use manual cropping tool. When Ofoto finally saves the image, it saves a calibrated halftone that is correctly oriented. This saved image has precisely the amount of pixel data needed to produce the desired image on the printer you selected before you started scanning. All this happens in a couple of minutes. Oh, and in case you're wondering, it *can* save TIFF and EPS images. Apple is learning. Of course, the default format is PICT.

There's one more feature of Ofoto worth mentioning. Suppose, after making your original scan, you decide to use only a portion of your image. Let's say you're running System 7 and you've saved a scanned file, moused over to QuarkXPress, placed your image in a document, and determined that you wanted to fit the graphic into a 4-x-6-inch space. If your original is still in the scanner (and you have enough RAM to keep both Ofoto and QuarkXPress active), you can use Ofoto's Selection Controls to lock the image's height, width, and/or scale. When you go to select the portion of the image you want to rescan, Ofoto ensures that it will fit within the desired space in your QuarkXPress document. It automatically rescans at the proper resolution for the enlarged or reduced image size you selected, *and it remembers the proper rotation from the previous scan.* All you have to do is click on the Scan button.

So maybe now you're worrying about how much you're going to have to shell out for RAM to take advantage of all this cool stuff. Don't panic. Ofoto runs and performs quite admirably with 2 megabytes.

Here and Hereafter

You say you've just bought another vendor's scanner, but Ofoto sounds like the software for you? Sorry, Charlie. It's available only with Apple's OneScanner. If you have one of the original Apple Scanners, however, Ofoto will work with it. The software upgrade is available from LightSource ([800] 231-7226) for $195. Will Ofoto eventually hit the market as a stand-alone product? Apple and LightSource answer with a resounding "No comment." But it would be a really good idea, wouldn't it?

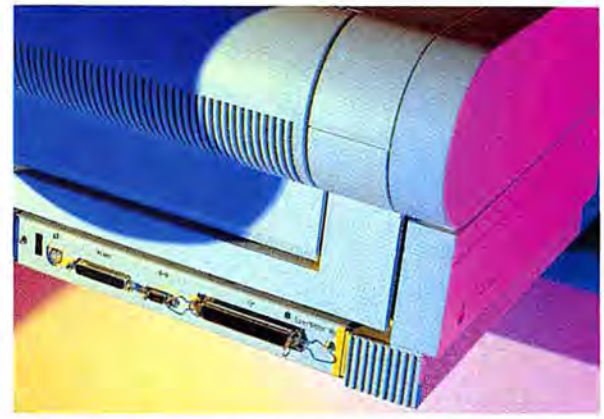


Figure 4: Apple's LaserWriter IIg is the first Apple printer to offer a built-in EtherTalk connection, visible just to the left of the 50-pin SCSI port.

So Apple has three new imaging products: the LaserWriter IIf and IIg PostScript printers and the OneScanner 8-bit gray-scale scanner with Ofoto software. The LaserWriter IIf ($3,599) is a solid substitute for the IINTX, with significantly improved performance when printing graphics and at a more competitive price (the IINTX list price was $4,999). The LaserWriter IIg ($4,599) has two claims to fame. The PhotoGrade technology that comes standard provides a leap forward in gray-scale-imaging quality on the desktop. If a PostScript printer is your final output device for halftoned images, you should take a serious look at the IIg. It is also the first Apple printer with an EtherTalk port and by far the lowest-priced printer on the market to provide EtherTalk connectivity. Hopefully, Apple will be able to achieve both high-quality gray-scale images and increased speed in generating them when the unit ships in October. Upgrades from the LaserWriter IISC, IINT, and IINTX to the IIf or IIg are available.

The real winner in the new lineup is the Ofoto scanning software that ships with the OneScanner. Ofoto is unquestionably the easiest-to-use and most powerful scanning software on the market. Other applications offer more-extensive image-editing capabilities, but for obtaining a high-quality scan with an extremely low user-headache factor, Ofoto is unsurpassed. If you are in the market for a gray-scale scanner, check out the OneScanner/Ofoto bundle ($1,299) before making a decision. If you already own a scanner, pray that LightSource will release Ofoto as a stand-alone application.

Henry Bortman is *MacUser*'s technical director. His idea of a good time is drawing pictures of PostScript halftone cells round about midnight.



We're proud



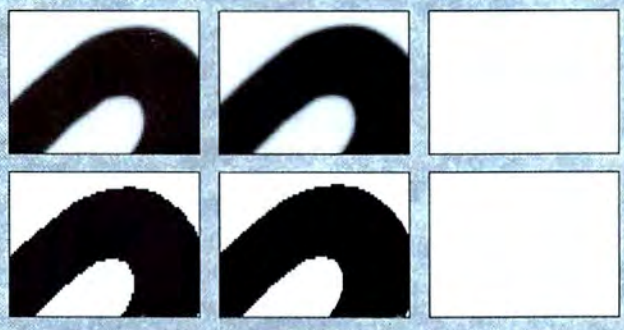
Microtek 600ZS $2,195*



Howtek Scanmaster 3 $8195**



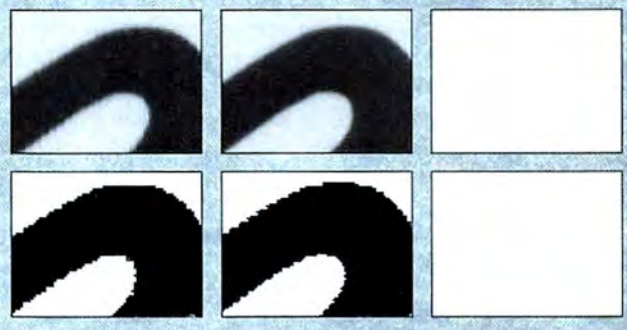
La Cie Silverscanner $1,999



Microtek 600ZS 300 dpi at 1600%

Microtek 600ZS 600 dpi at 800%

Microtek 600ZS 1200 dpi at 400%—n/a



Howtek Scanmaster 3 300 dpi at 1600%

Howtek Scanmaster 3 400 dpi at 1200%

Howtek Scanmaster 3 1200 dpi at 400%—n/a

Seeing is believing.

That's why we at La Cie want you to see how good our Silverscanner really is. We're so confident in the quality of our scanner image that we are willing to compare it to other scanners right here in front of you. Compare for yourself.

Great color the first time.

Just look at the difference in the color scans. The single-pass Silverscanner has three separate noble gas-filled lamps for red, blue and green that are balanced so you get great scans the first time. With Silverscanner's built-in gamma correction, you get clean, bright scans with excellent detail in those hard-to-get areas that don't require difficult adjustment like other scanners. This can mean substantial time savings when every second counts.

The shadow knows.

Do you want good shadow detail? Then compare the black and white scans. The Silverscanner can give you production quality gray-scale scans for magazines, newspapers and brochures.

Lay it on the line.

When it comes to scanning line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an ***electronic stat***. Compare the scans of line art shown here. The comparison is incomplete, however, because some scanners don't have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it's clear how much better the Silverscanner is, especially if you look at the price!

La Cie Silverscanner

$1999

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of our image.



Microtek 600ZS $2,195*



Howtek Scanmaster 3 $8195**



La Cie Silverscanner $1,999



La Cie Silverscanner
300 dpi at 1600%



La Cie Silverscanner
600 dpi at800%



La Cie Silverscanner
1200 dpi at 400%



La Cie Silverscanner
1200 dpi at 100%

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, Quark XPress and a PostScript Imagesetter. The entire production cost was $145.

Software to die for!

We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software and Silverscan plug-ins are no exception. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. With features like fast dynamic ***color*** previews, independent color and brightness controls, nine scanning modes, savable scan settings, proportional scaling, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% increments, and 25 dpi to 1200 dpi in 1 dpi increments. And Silverscan is OCR and Apple System 7 compatable.

As a special bonus, Silverscanner comes with full versions of Adobe Photoshop ***and*** Letraset's ColorStudio— a $2139 value!

Who ya gonna call?

La Cie can offer you (toll-free) expert technical support after the sale. We know scanning inside and out. From line art to color separations, we can help you. And we'll be here for you tomorrow. La Cie is a Quantum Company, backed by $400 million in assets.

Image is everything.

La Cie is so proud of the Silverscanner, we used it to produce this ad. Not just the comparisons, ***everything.*** If you like our image, this is the scanner you've been waiting for. Just call and order yours today.

"The choice is clear . . . buy the La Cie Silverscanner."
Macworld, June 1991

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To order or for more information, call toll-free

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DOUBLE-DUTY DRIVES:

Multifunction Optical Storage

Need unlimited storage capacity? Absolute data security? MacUser Labs previews three new technologies that offer both.

Storage strategy used to be simple: Buy the biggest hard drive you could afford. But even the most mammoth disk fills up fast when stuffed with enormous TIFF images, gargantuan CAD files, jumbo animations, and colossal collections of data. When your overloaded drive begins to shout, "There is not enough room on the disk . . ." you can buy a bigger one — but what happens when that one fills up?

Absolute data security has traditionally also been a simple concept: It's impossible. Even a rugged hard drive can fail, and the most carefully coddled backup tape can mysteriously mangle precious data. Although good data-recovery software can recover 90 percent of fractured files, Murphy's Law decrees that your most crucial data will reside somewhere in that missing 10 percent.

BY JOHN RIZZO
AND THE MACUSER LABS STAFF

PHOTOGRAPHY: FRED STIMSON


Optical Disk Drive
POWER
Panasonic
OPTICAL DISK
CARTRIDGE
Single Sided
A

Multifunction Optical Storage

Now there's an entirely new type of drive, one that combines the unlimited capacity of a removable-cartridge system with the ability to write data in permanent, unalterable, unerasable form. What's more, both operations use rugged, reliable optical technology and both use cartridges that can contain as much as 1,000 megabytes of data. These *multifunction* drives use both *erasable optical* and *WORM* (write once, read many) cartridges — and some are selling for about the price of drives that can accept only one type of cartridge.

This month MacUser Labs looks at three mechanisms that combine WORM and erasable optical technologies. When we began our testing, only one manufacturer — Pioneer — was shipping a Mac-capable mechanism, the DE-S7001. The Panasonic LF-7010 and the Hewlett-Packard Model 650/A (based on a Sony mechanism and modified by Hewlett-Packard) quickly followed. As we went to press, more than a dozen vendors had packaged one or more of these mechanisms into drives that connect to your Mac (see Table 2) and Sony released its version of the Hewlett-Packard drive mechanism.

Erasable optical drives offer the same read/write capabilities as hard drives do (see "Erasable Optical Drives," November '90, page 102). They're faster than WORM drives, four to five times faster than CD-ROM drives, and getting faster every year. Today's models are even fast enough to be used as startup drives — although the most efficient configuration is to keep your System Folder and applications on a small, fast hard-disk drive and your data files on optical discs. Although this approach is somewhat slower than using a hard drive for everything, it enables you to take advantage of the erasable optical drive's unlimited storage capacity.

Erasable optical drives also offer advantages over tape drives for backup. Because erasable discs are mountable volumes that look and act like hard disks on the desktop, you can access your data on an optical disc if your hard disk fails — without having to restore your data to a hard disk. Data from an optical drive can also be retrieved more quickly than can data on a tape, because optical mechanisms (like hard drives) can randomly access data instead of having to search sequentially, as do tape drives. And if you need immediate access to data that's backed up on a tape but don't have a healthy hard disk onto which you can restore it, you're probably out of luck — most tape drives cannot be mounted on the desktop. Erasable optical discs are also more durable, having a shelf life of around 15 years compared with about 5 for tape.

WORM discs are optimum for permanent archiving, because data written to them cannot be altered or overwritten. With an estimated media shelf life of up to 100 years, WORM is the ideal electronic archival technology. Unlike tape or microfiche, WORM technology offers quick on-line access in a rugged and compact format.

Optical Lite

Watching your budget as well as your megabytes? Well, you no longer have to pay more for an optical drive than you did for your Mac — 3.5-inch erasable optical drives are here. These drives can store up to 128 megabytes, considerably less than their 650-to-1,000-megabyte counterparts, on a removable cartridge. But they do offer the same level of data security, with the portability of floppy disks and a speed that's close to that of a typical hard drive.

The current speed leaders are the Ocean Technologies Ocean Vista 130 and the Pinnacle Micro Pinacle REO-130, based on the RMD-5100-S mechanism, from MOST. These drives boast an average seek time of 35 milliseconds — faster than any 5.25-inch optical unit. Unfortunately, the drives themselves are not that much smaller than 5.25-inch drives. The price hasn't shrunk that much either, with drives for the Mac costing about $3,000. Disc cartridges cost about $130, half the price of 5.25-inch optical cartridges.

A new generation of 3.5-inch optical mechanisms with further reduced price and size should be available to drive manufacturers by the time you read this. Optical Access International is offering a new drive, called the Access 350, based on a mechanism from Panasonic that has an access time of 40 milliseconds. Not only are the cartridges approximately the same size as floppy disks but because this mechanism is about the same size as the Mac's floppy drive, it can also be installed inside a Mac in

Multifunction Mechanisms

Each of the three multifunction mechanisms we looked at uses 5.25-inch optical cartridges — but each uses a radically different method of storing data. The Pioneer DE-S7001 mechanism uses MO (magneto-optical) erasable and ablative WORM technologies, the Hewlett-Packard Model 650/A uses MO erasable technology and a new type of MO WORM technology, and the Panasonic LF-7010 uses a nonstandard technology for both its WORM and erasable modes.

The Pioneer mechanism, like that of most erasable optical drives, writes to an erasable disc. A laser heats a spot on the disc to about 150 degrees centigrade, at which point the spot takes on the polarity of an electromagnet on the other side of the disc (see the "How It Works: Multifunction Optical Storage" sidebar). This combination of heat, electromagnetism, and light gives MO its other name, *TMO*, for *thermal magneto-optical* technology.

One benefit of MO technology is that the temperature at which the MO media can have its polarity changed (150 degrees centigrade) is high enough to prevent media alteration at room temperature. It's also relatively harmless to the media, which can withstand up to 10,000,000 erase/write cycles. An erase pass must be performed, however, to make the polarity of a sector uniform before the write pass can be made. The erase pass effectively doubles the write time. The Pioneer

place of a floppy drive. The mechanism weighs less than a hard drive, so it will make a good storage choice for a portable Mac — if it doesn't require too much power. The Access 350 has a list price of $1,999 (media prices were unavailable at press time). Optical Access International, Inc., 800 W. Cummings Park, Ste. 2050, Woburn, MA 01801; (800) 433-5133 or (617) 937-3910.

Although Optical Access should be the first to ship a drive that uses this 3.5-inch Panasonic mechanism, it is likely that other vendors will offer similar drives. With their high capacity, imperviousness to magnetic fields, and small size, this coming generation of 3.5-inch erasable optical drives promises to be a superior alternative to magnetic SyQuest, Ricoh, and Bernoulli drives.

DE-S7001, which is compatible with Pioneer's other erasable optical drives, fits more data on a disc than does the Hewlett-Packard Model 650/A. But the formatting method used by Pioneer for the DE-S7001, unlike that used by either the Panasonic LF-7010 or the Hewlett-Packard Model 650/A, resembles that of a hard disk, making it vulnerable to performance reduction due to data fragmentation, just like a hard disk.

The Pioneer DE-S7001's WORM mode uses the time-tested *ablative* technique, in which the laser cuts into the media, creating a permanent pit. WORM cartridges used in the DE-S7001 mechanism are also compatible with Pioneer's popular DD-5001 WORM drives. A particularly handy feature of the DE-S7001 is its front-panel lights, which tell you whether an erasable or a WORM cartridge is in the drive.

The Hewlett-Packard Model 650/A mechanism uses MO-technology methods for its erasable as well as its WORM modes. The Model 650/A uses a *write-protected* MO cartridge when in WORM mode. Custom tracks on the MO disc tell the drive's firmware to switch to WORM mode and to implement three levels of write protection so that only empty blocks on the disc can be written to. The Hewlett-Packard WORM medium has the same 10-year archival life as an erasable optical disc instead of the century life span boasted by some ablative-WORM discs, meaning that it's a much less durable archiving medium. The erasable format is compatible with drives based on MaxOptix, Ricoh, Sharp, and Sony mechanisms.

A major advantage of the Panasonic LF-7010 is that its *phase-change* mechanism can directly overwrite data. This capability makes the LF-7010 write about twice as fast as MO mechanisms, which require a separate erase pass before writing. A laser changes the structure of the 1,000-megabyte erasable disc's metal alloy between an *amorphous*, or random, state and a *crystalline*, or highly ordered, state. This is a more drastic change to the media than that caused by MO technology, and it lowers the number of overwrite cycles to 100,000 — 1 percent of that of MO.

The LF-7010 keeps track of which sectors are approaching the 100,000-cycle threshold and prevents writing to these sectors (the drive does continue to allow reading from these sectors, however), which reduces the writable space on discs as they age. This threshold might be a concern on a heavily used file server but shouldn't pose a problem for most desktop uses. And of course, you can always change discs.

The Panasonic LF-7010 also uses phase-change technology in WORM mode. Like the write-protected MO WORM media used by the Hewlett-Packard Model 650/A, the LF-7010's WORM media contain code that tells the drive to switch to WORM mode and to implement write-protection methods to ensure that data is not overwritten.

The chemical composition of the WORM media is different, making it impossible to alter a sector once data has been written to it. The LF-7010 can write to and read 940-megabyte double-sided and 470-megabyte single-sided WORM cartridges used in Panasonic's other WORM drives.

One significant weakness of the LF-7010 is that its WORM media are guaranteed for only 10 years — nowhere near the 100-year expected life span of some ablative-WORM discs. Also noteworthy is that the Panasonic LF-7010's erasable discs contain tellurium — a toxic heavy metal. Users are protected, in that the metal is sealed within the disc, but check with a local environmental-protection agency for guidelines on how to dispose of old discs properly.

Another unfriendly aspect of the LF-7010 is that ejecting a cartridge requires two operations — pushing a button on the drive and then dragging the icon to the Trash. The other two mechanisms obey the Mac convention of spitting out the cartridge when you drag its icon into the Trash. But for most users, this slight inconvenience will be more than outweighed by the LF-7010's price — at $3,995 it's the least expensive multifunction mechanism we've seen.

Speed, Spin, and Software

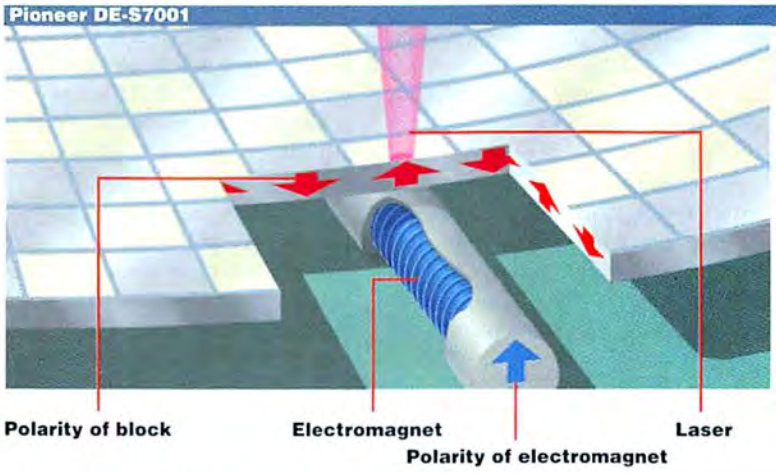
As with hard drives, driver software plays an important part in multifunction-drive performance. Although the three mechanisms we tested came directly from the manufacturers, competing products using the same mechanisms and different driver software may have significantly different performance. For our tests, we used drivers written by Optical Access International on the Pioneer and Panasonic mechanisms. We also used a driver from Corel on the Panasonic unit. Software Architect's Formatter One, a generic driver, was used on the Hewlett-Packard mechanism, because no drivers specific to this mechanism were available.

Of the three mechanisms, only the Pioneer DE-S7001 had Mac software shipping at press time — we used beta copies of drivers for the Panasonic and Hewlett-Packard mechanisms. Even though it was a shipping version, the Pioneer mechanism was the slowest in all our tests — in erasable as well as in

How It Works: Multifunction Optical Storage

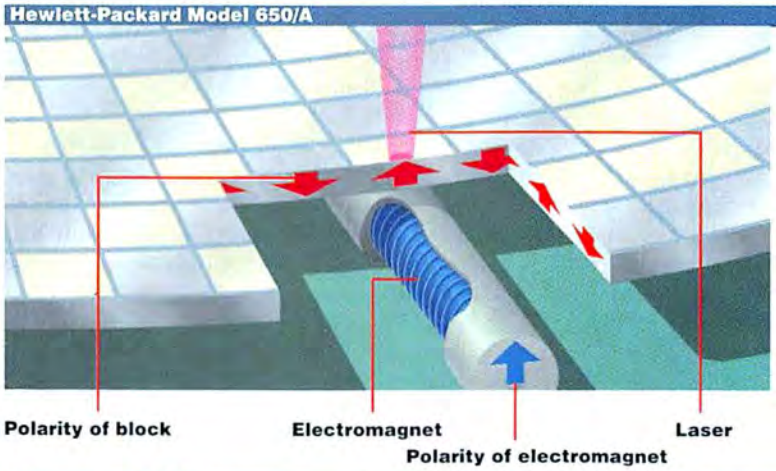
A multifunction drive offers more flexibility than does any other optical storage device. In erasable mode, a multifunction drive is slower than a hard-disk drive but offers unlimited capacity and greater data security. In WORM (write once, read many) mode, the drive can create permanent archives with the convenience of random access. To provide this flexibility, multifunction drives must accomplish four distinct operations — writing to and reading from erasable media and writing to and reading from WORM media (without allowing the

Pioneer DE-S7001



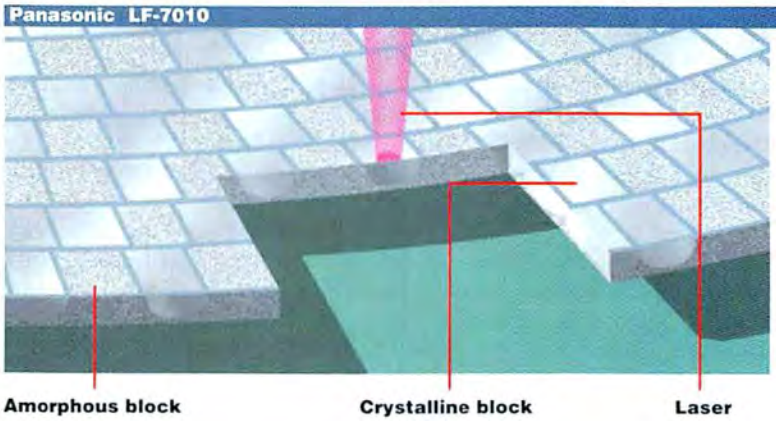
Writing to an erasable disc: A laser heats a spot on the disc to about 150 degrees centigrade, at which point the spot takes on the polarity of an electromagnet on the opposite side of the disc. An erase pass must be made first to make the polarity of a sector uniform before the write pass can occur.
Reading an erasable disc: The laser beam reflects differently, depending on the polarity of the point on which it's focused. These differences are read as data values.

Hewlett-Packard Model 650/A



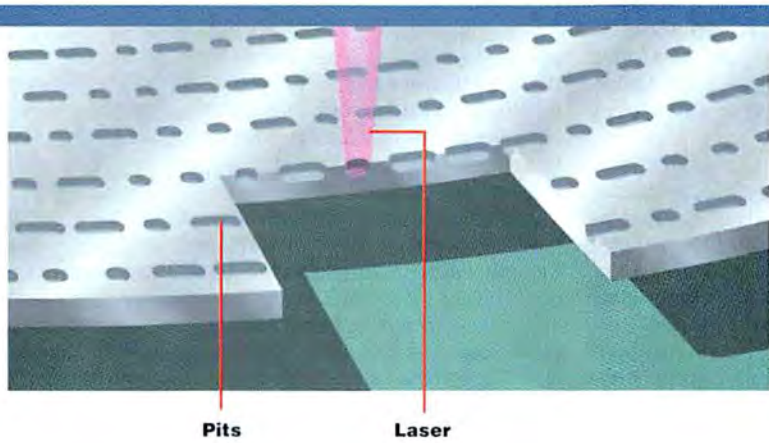
Writing to an erasable disc: The Model 650/A uses magneto-optical methods to write data. A laser heats a spot on the disc to about 150 degrees centigrade, at which point the spot takes on the polarity of an electromagnet on the opposite side of the disc. An erase pass must be made first to make the polarity of a sector uniform before the write pass can be performed.
Reading an erasable disc: The laser beam is reflected differently, depending on the polarity of the point on which it's focused. These differences are read as data values.

Panasonic LF-7010

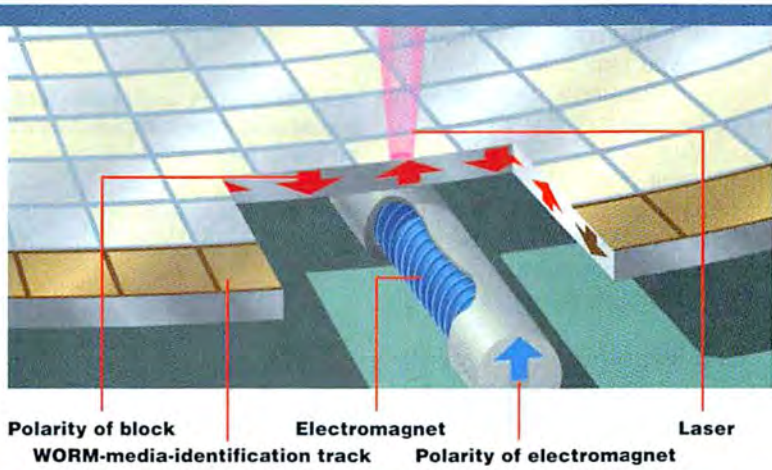


Writing to an erasable disc: A laser changes a spot on the disc's tellurium-metal alloy from its usual *amorphous*, or random, state into a *crystalline*, or highly ordered, state. To overwrite this spot on the disc, a more powerful burst of the laser melts the alloy, returning it to an amorphous state. This method allows the direct overwrite of data, reducing write times.
Reading an erasable disc: A laser beam reflects off the disc; amorphous areas are dull, and the crystalline areas are shiny. The differences in reflectivity are read as data.

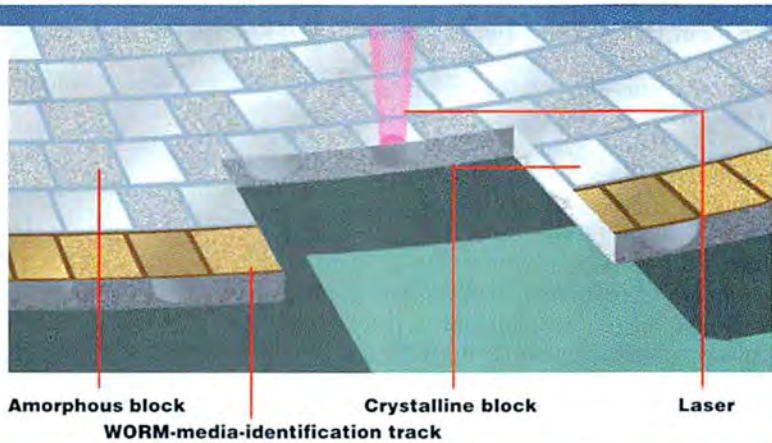
overwriting of existing data). The three mechanisms we examined use different methods to do these tasks. The Pioneer mechanism uses *magneto-optical* technology in its erasable mode and *ablative* technology in WORM mode. The Hewlett-Packard mechanism also uses magneto-optical technology in erasable mode and a write-protected form of magneto-optical technology in WORM mode. The Panasonic mechanism uses *phase-change* technology in its erasable mode and a write-protected form of phase-change technology in WORM mode.



Writing to a WORM disc: The laser cuts a permanent pit into the disc's medium. This technique is called *ablative* writing. Because the pits are permanent, the data can never be altered. This medium can last up to 100 years.
Reading a WORM disc: Each pit causes the laser beam's reflection to be more diffuse than when it reflects from the smooth, unpitted disc surface. These differences are read as data.



Writing to a WORM disc: The WORM disc, like the erasable medium, is magneto-optical, but it contains code on its outer track that tells the drive to switch to WORM mode. In WORM mode, the drive's firmware allows writing only to empty blocks.
Reading an erasable disc: WORM media are read in the same manner as erasable media — both use magneto-optical technology.



Writing to a WORM disc: The WORM disc contains code on its outer track that tells the drive to switch to WORM mode. In WORM mode, the drive's firmware allows writing only to empty blocks. The chemical composition of the WORM media is different from that of the erasable media, so that once it has been altered by the laser, it cannot be changed.
Reading a WORM disc: WORM discs are read in the same manner as erasable discs — they both use phase-change technology.

The Bottom Line

A multifunction optical drive offers unlimited storage as well as the ultimate in data security, because it can accept both erasable and WORM (write once, read many) cartridges. Three multifunction technologies are currently available in mechanisms manufactured by Panasonic, Pioneer, Sony (not available for review), and Hewlett-Packard (based on the Sony mechanism). With the exception of the tests we conducted with the Pioneer mechanism, all our tests were performed with unreleased driver software—although both Panasonic and Hewlett-Packard should have completed their software by press time.

The choice among mechanisms boils down to conventional magneto-optical versus phase-change erasable technologies and ablative versus magneto-optical WORM technologies. Of the erasable technologies, we recommend the **Panasonic LF-7010** phase-change mechanism ($3,995) — it has the fastest speed and the highest capacity. Of the WORM techniques, the ablative technology of the **Pioneer DE-S7001** ($5,090) ensures the longest life for your data. However, the speed and larger capacity of Panasonic's media, as well as the promise of increased durability in the future, make its phase-change WORM a solid alternative to the Pioneer DE-S7001's ablative WORM.

Our overall choice for a multifunction-drive mechanism is the Panasonic LF-7010. In addition to having faster speed and higher capacity, it's also the least expensive of the three mechanisms. However, because of the limited number of read/write cycles that phase-change discs can handle, you may want to consider our second choice, the **Hewlett-Packard Model 650/A** ($6,435). It's slower than the Panasonic mechanism and more expensive; it's big too — a drive containing it takes up almost as much desk space as a Mac IIci. However, it can read and write erasable optical discs from drives based on MaxOptix, Ricoh, Sharp, or Sony mechanisms.

A multifunction drive based on the Pioneer DE-S7001 mechanism is recommended if you need to share WORM and erasable cartridges with other Pioneer-based drives and if you need absolute maximum data security. It's slower than the other two mechanisms, but it's well built, takes up the least amount of desk space, and is less expensive than the Hewlett-Packard unit. It also uses an ablative-WORM mechanism — a real benefit if you need to archive something for decades.

WORM mode. (The Hewlett-Packard mechanism's Macintosh-compatible WORM mode was not yet ready for testing at press time, because of its lack of driver software.)

We were impressed by the easy-to-use formatter software and useful diagnostics that came with the drivers from Optical Access. The Access Histories DA, which works in WORM mode, is particularly useful. Although you can't erase files from a WORM disc, you can write a new directory that ignores previously written files so they appear to have been erased. The Access Histories DA lets you "reset" your WORM drive to any previous directory, giving you access to files on the disc as well as creating a sequential history of the disc itself.

As expected, the Panasonic LF-7010's write time in erasable mode proved to be twice as fast as the Pioneer DE-S7001's, because of the former's combined erase/write pass. The Hewlett-Packard mechanism performed nearly as well as the Panasonic unit, because it spins the disc at 2,400 rpm — one-third faster than the others — increasing throughput by moving more data past the head in the same amount of time.

A Standard Future

If your hard drive has filled up and it appears you may have to resort to using compression software to cram more data into it or if you're worried about data security but can't justify the price of a WORM-only drive, a multifunction optical drive and a few cartridges might be your ideal solution. Which mechanism you should choose, however, is a more difficult decision.

It's likely that one of the three multifunction mechanisms we previewed will dominate the field in the next two years, but it's difficult to say which one it'll be. The Panasonic LF-7010 has the edge in speed, and the Pioneer DE-S7001 uses current standards for both erasable and WORM. Sony, which recently announced its own multifunction mechanism — upon which the Hewlett-Packard Model 650/A mechanism is based — is perhaps the biggest force in the optical market, however.

The promise of further development in phase-change technologies and optical storage in general (see the "Optical Lite" sidebar) makes us hope that the speedy Panasonic mechanism will hold its own against Sony's influence when future standards are established.

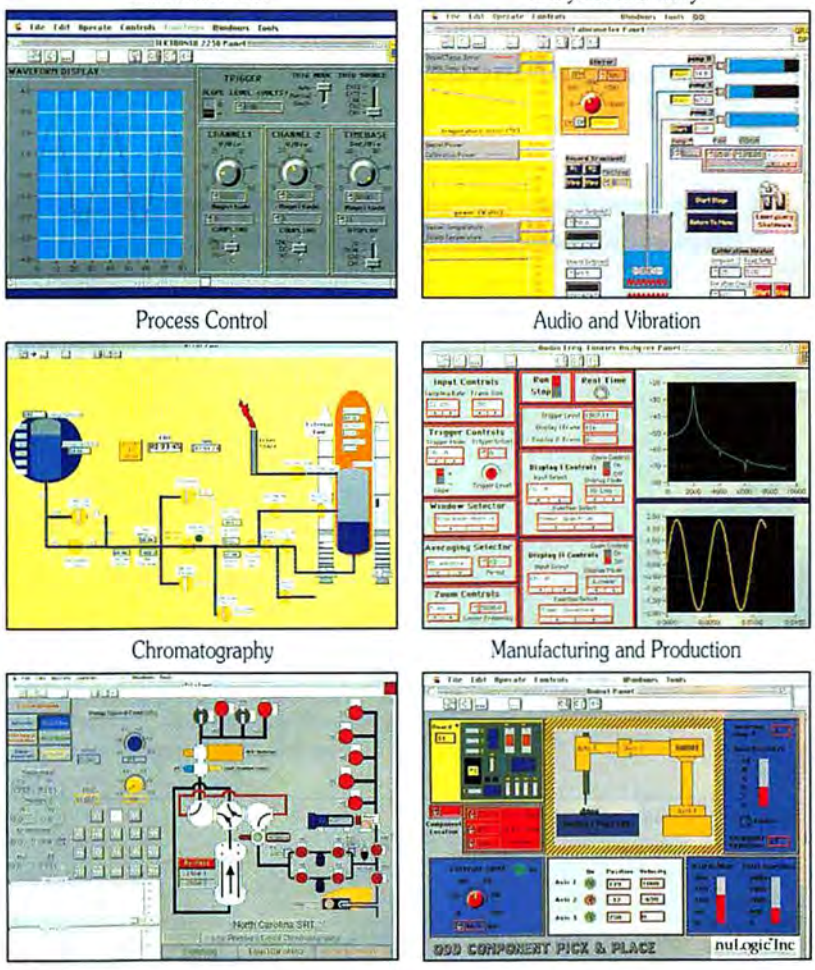
John Rizzo, *MacUser*'s technical editor, has been a user and advocate of optical storage since he began covering the subject in 1987.

Table 1 Criteria

List price — Suggested retail price of the drive, including the Mac interface.
Capacity — Unformatted capacity of both sides of a disc.
Recording technology — Method used to write data onto a disc.
Read transfer rate — Speed of reading data from the disc.
Write transfer rate — Speed of writing data to the disc.
Media price — Suggested retail price of disc cartridge.
Media life span — How long the media are expected to last.
Compatibility — Other drives with which discs can be shared.
Seek time — Time needed to find a specific block of data.
SCSI-ID selector — What you use to select the SCSI-ID number on the drive.
SCSI termination — The location of the terminator.
SCSI connectors (number, type) — The number and type of connectors.



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Table 1: Features of Multifunction Optical Storage Mechanisms

			
	Hewlett-Packard Model 650/A	**Panasonic LF-7010**	**Pioneer DE-S7001**
List price	$6,435	$3,995	$5,090
Pros	Compatibility of erasable media across drives from several manufacturers.	Direct overwrite permits fast write times. High capacity. Includes head-cleaning cartridge.	High track density provides great future storage capacity. Drive operates in horizontal or vertical position.
Cons	WORM media are expensive to produce and have a short life span. Expensive.	Compatible with Panasonic mechanisms only. Operates in horizontal position only.	Compatible with Pioneer mechanisms only. Slow.
Erasable mode			
Capacity	650 MB	1,000 MB	654 MB
Recording technology	magneto-optical	phase-change	magneto-optical
Read transfer rate	680 Kbps	983 Kbps	491 Kbps
Write transfer rate	340 Kbps	552 Kbps	163 Kbps
Media price	$199	$245	$250
Media life span	10 years or more	10 years	15 years
WORM mode			
Capacity	650 MB	940 MB	654 MB
Recording technology	magneto-optical	phase-change	ablative
Read transfer rate	680 Kbps	983 Kbps	491 Kbps
Write transfer rate	340 Kbps	522 Kbps	245 Kbps
Media price	$199	$149	$145
Media life span	10 years or more	10 years	100 years
Hardware			
Compatibility	drives based on MaxOptix, Ricoh, Sharp, and Sony mechanisms	other Panasonic WORM drives	other Pioneer erasable and WORM drives
Seek time	95 ms	90 ms	53 ms
SCSI-ID selector	DIP switches	rotary switch	DIP switches
SCSI termination	external	internal	internal
SCSI connectors (number, type)	2, 50-pin	2, 50-pin	2, 50-pin
Dimensions (L x W x H, in.)	11.2 x 12.8 x 4.25	15.24 x 8.11 x 4.92	13 x 8.69 x 4.94
Company	Hewlett-Packard Greeley Storage Division 700 71st Ave. Greeley, CO 80634 (800) 752-0900 (301) 670-4300	Panasonic Communications and Systems Co. Office Automation Group Two Panasonic Way Secaucus, NJ 07094 (800) 742-8086	Pioneer Communications of America, Inc. Optical Memory Systems Division 600 E. Crescent Ave. Upper Saddle River, NJ 07458 (800) 527-3766 (201) 327-6400

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SCSI SPEED EVALUATOR TESTS, *MACWORLD* 1991

	Read	Write	R/W Total
Pinnacle Micro REO-650	3031	1924	4955
FWB HammerDisk 600S	3063	1858	4921
SuperMac LaserFrame	2454	1781	4235
Storage Dimensions EO 1000	3000	1061	4061
MicroNet SB-SMO-1	2426	1127	3553
PLI Infinity Optical	1684	1866	3550

Optical drives are now 100% faster than in previous tests performed by *MacWorld* in 1990, making optical technology a viable replacement for hard disk drives. Since optical drives are more reliable and support removable media, the applications and capacities are virtually endless.

OPTICAL DRIVES LIST PRICE, *MACWORLD* 1991

	List Price	Price Difference
Pinnacle Micro REO-650	$4294	—
PLI Infinity Optical	4699	405
MicroNet SB-SMO-1	4995	701
FWB HammerDisk 600S	5495	1201
SuperMac LaserFrame	6499	2205
Storage Dimensions EO 1000	6695	2401

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Table 2: The Multifunction Marketplace

	Bytewide DE-S7001	Computer Upgrade OMNISTOR	Computer Upgrade LF-7010	Corel Systems Qurata
Mechanism	Pioneer DE-S7001	Pioneer DE-S7001	Panasonic LF-7010	Panasonic LF-7010
List price	$5,870	$4,195	$4,195	$3,395
WORM-media cost	$180	$125	$125	$150
Erasable-media cost	$313	$185	$185	$210
Driver	Corel	Deltaic	Omnicache	Corel
Options	Mac device driver, $350	formatting utility included	formatting utility included	one erasable cartridge included; Mac device driver, $395
Company	Bytewide 522 Fairway Ave. La Chine, Quebec H8T 1C1 Canada (800) 465-5241 (514) 636-5938	Computer Upgrade Corp. 2910 E. La Palma Ave., Ste. A Anaheim, CA 92806 (714) 630-3457	Computer Upgrade Corp. 2910 E. La Palma Ave., Ste. A Anaheim, CA 92806 (714) 630-3457	Corel Systems Corp. 1600 Carling Ave. Ottawa, Ontario K1Z 8R7 Canada (613) 728-8200

Table 2: The Multifunction Marketplace, continued

	Corel Systems MF650	FWB hammerDisk 600F	Graphic Technology DE-S7001	Kintronics DE-S7001
Mechanism	Pioneer DE-S7001	Sony E511*	Pioneer DE-S7001	Pioneer DE-S7001
List price	$4,999	$6,199	$4,695	$3,178
WORM-media cost	$150	$199	$145	$117
Erasable-media cost	$210	$199	$250	$175
Driver	Corel	HD ToolKit	Corel	Optical Access
Options	one erasable cartridge included; Mac device driver, $395	Mac device driver and one erasable cartridge included	Mac device driver, $400	Mac device driver included
Company	Corel Systems Corp. 1600 Carling Ave. Ottawa, Ontario K1Z 8R7 Canada (613) 728-8200	FWB, Inc. 2040 Polk St., Ste. 215 San Francisco, CA 94109 (415) 474-8055	Graphic Technology, Inc. 5555 W. 78th St., Ste. D Edina, MN 55439 (800) 999-9382 (612) 944-1121	Kintronics, Inc. Three Westchester Plaza Elmsford, NY 10523 (800) 431-1658 (914) 347-2530

*The Sony E511 mechanism has the same specifications as the Hewlett-Packard Model 650/A.

Table 2: As we went to press, more than a dozen vendors were preparing to release drives based on the Hewlett-Packard, Panasonic, and Pioneer mechanisms. Different driver software and mechanism combinations will affect performance, so check with your dealer for the specifications of these drives. Please note that some of these drives use the Sony E511 mechanism. The Hewlett-Packard Model 650/A is an adaptation of the Sony E511 mechanism, so their specifications are almost identical.

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8005-3	**Image Gallery,** any 600 on CD (ea. $0.67) ...	$399.00	$259.00
8015-1	**Image Folio,** 4000 photos ..	$399.00	$259.00
8515	**Toolworks Encyclopedia** .	$395.00	$49.95
8585	**U.S. History**	$395.00	$29.95
8595	**Guinness World Book of Records**	$149.00	$29.95
8575	**Time Table of History**	$99.95	$29.95
8830	**Family Doctor**	$179.95	$29.95
8750	**Classic Collection:** Sherlock Holmes, Shakespeare and Birds of America	$297.00	$89.95

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Table 2: The Multifunction Marketplace, continued

	Kintronics LF-7010	Laser Magnetic Storage LD 520-601	Optical Access Access MF Gigabyte	Optical Access Access MF/7001
Mechanism	Panasonic LF-7010	Pioneer DE-S7001	Panasonic LF-7010	Pioneer DE-S7001
List price	$3,293	$3,875	$3,995	$4,995
WORM-media cost	$112	$99	$175	$145
Erasable-media cost	$184	$175	$295	$250
Driver	Optical Access	Optical Access	Optical Access	Optical Access
Options	Mac interface included	Mac device driver included	Mac device driver and one erasable cartridge included	Mac device driver included
Company	Kintronics, Inc. Three Westchester Plaza Elmsford, NY 10523 (800) 431-1658 (914) 347-2530	Laser Magnetic Storage 4425 Arrowswest Dr. Colorado Springs, CO 80907 (800) 777-5674 (719) 593-7900	Optical Access International 800 W. Cummings Park Ste. 2050 Woburn, MA 01801 (800) 433-5133 (617) 937-3910	Optical Access International 800 W. Cummings Park Ste. 2050 Woburn, MA 01801 (800) 433-5133 (617) 937-3910

Table 2: The Multifunction Marketplace, continued

	Optima Technology Concorde 600MMO	Pinnacle Micro MFO 650	Relax Technology Vista Multifunction	RexSys Pioneer Multifunction
Mechanism	Sony E511*	Sony E511*	Pioneer DE-S7001	Pioneer DE-S7001
List price	$6,295	$4,195	$2,999	$4,695
WORM-media cost	$145	$250	$119	$145
Erasable-media cost	$175	$250	$189	$250
Driver	Optima	Pinnacle	Optical Access/Corel	Corel
Options	floppy-driver emulation, SCSI odometer, mirroring software, Mac application kit, and one erasable cartridge included	Mac interface, $199	one erasable cartridge included; Mac device driver, $239	Mac device driver, $395
Company	Optima Technology 17526 Von Karman Irvine, CA 92714 (714) 476-0515	Pinnacle Micro 15265 Alton Pkwy. Irvine, CA 92718 (800) 553-7070 (714) 727-3300	Relax Technology 3101 Whipple Rd. Union City, CA 94587 (415) 471-6112	RexSys Corp. 24 Graf Rd. Newburyport, MA 01950 (508) 465-6060

Table 2: The Multifunction Marketplace, continued

	Tass MO1000PA	Tass MFO650	Ten X Technology OptiXchange 650	Ten X Technology OptiXchange 940
Mechanism	Panasonic LF-7010	Sony E511*	Pioneer DE-S7001	Panasonic LF-7010
List price	$3,995	$3,595	$5,495	$5,495
WORM-media cost	$145	$135	$145	$150
Erasable-media cost	$250	$165	$250	$245
Driver	proprietary	proprietary	Optical Conversion Unit	Optical Conversion Unit
Options	Mac device driver and one erasable cartridge included	Mac device driver and one erasable cartridge included	SCSI hardware interface	SCSI hardware interface
Company	Tass 6730 Mesa Ridge Rd., Bldg. B San Diego, CA 92121 (619) 558-8882	Tass 6730 Mesa Ridge Rd., Bldg. B San Diego, CA 92121 (619) 558-8882	Ten X Technology 4807 Spicewood Springs Rd. Bldg. 3, Ste. 3200 Austin, TX 78759 (800) 922-9050 (512) 346-8360	Ten X Technology 4807 Spicewood Springs Rd. Bldg. 3, Ste. 3200 Austin, TX 78759 (800) 922-9050 (512) 346-8360

*The Sony E511 mechanism has the same specifications as the Hewlett-Packard Model 650/A.

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*NEC Silentwriter2 Model 90 $2,495**

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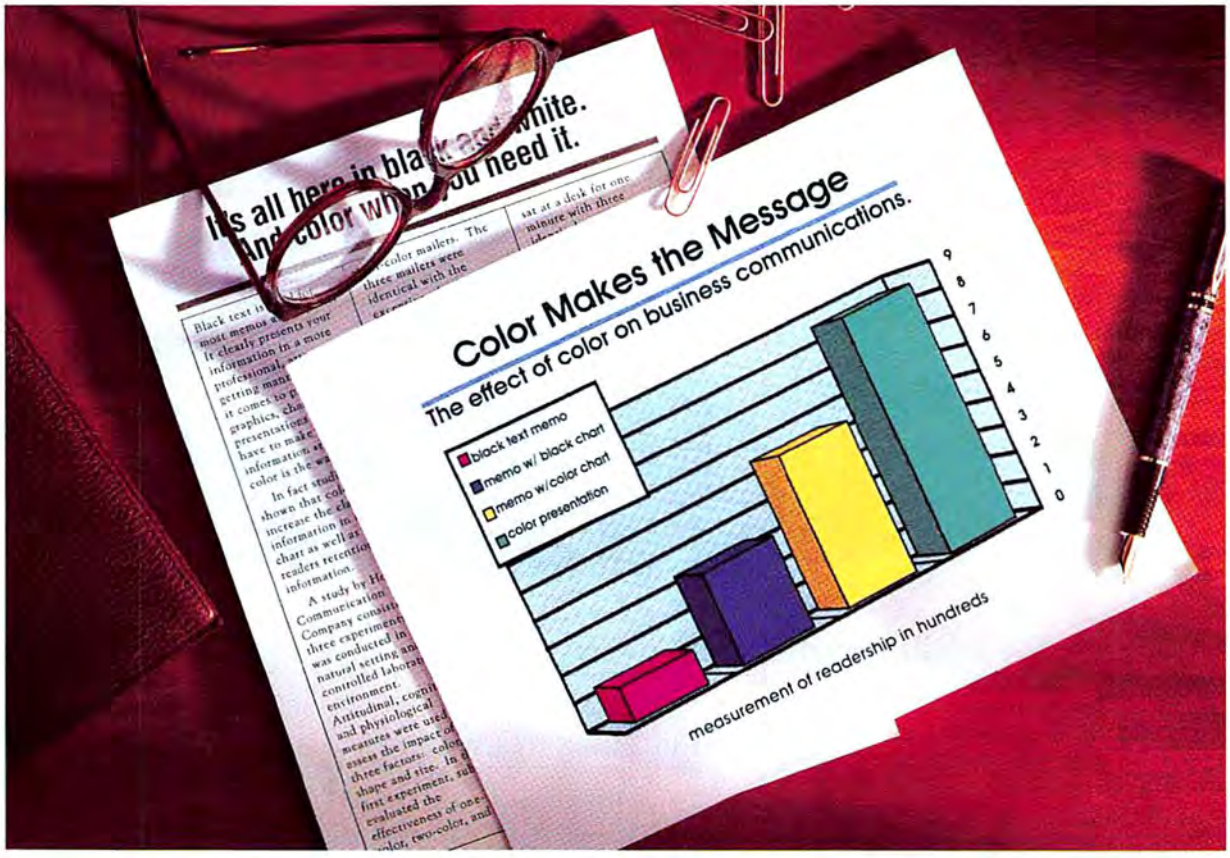
*Manufacturer's suggested retail price

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SEARCHING FOR STORAGE PERFECTION:

100-Megabyte Hard Drives

MacUser Labs goes inside thirty-two 100-megabyte drives to discover their hidden differences.

You know what you want when you're searching for 100 megabytes of storage: a hard drive that's fast and built to last. The price should be fair, the manufacturer dependable, and the warranty generous, and you wouldn't mind some free software in the bargain. But with more choices than Baskin-Robbins has flavors and with prices ranging from less than $400 to more than $1,500, how do you choose the drive that's perfect for your needs?

Simple. Just ask every hard-drive vendor to send you a drive for evaluation. Put each drive through a battery of tests. Compare its features, warranty, and bundled software with those of every other drive you can lay your hands on. Disassemble it to evaluate its construction and case design. Investigate the service options offered by each vendor. Survey dealers across the country to compile a street-price index to strengthen your bargaining position. And then, when you've finished all that, assemble a panel of experienced storage technicians to review your findings.

BY OWEN W. LINZMAYER
AND THE MACUSER LABS STAFF



PHOTOGRAPHY: WALT DENSON

CUTTING EDGE


N120
Ehman
UltraDrive 100S
GCC
MIRROR TECHNOLOGIES
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Figure 1: Overall Performance of 100-Megabyte Hard Drives

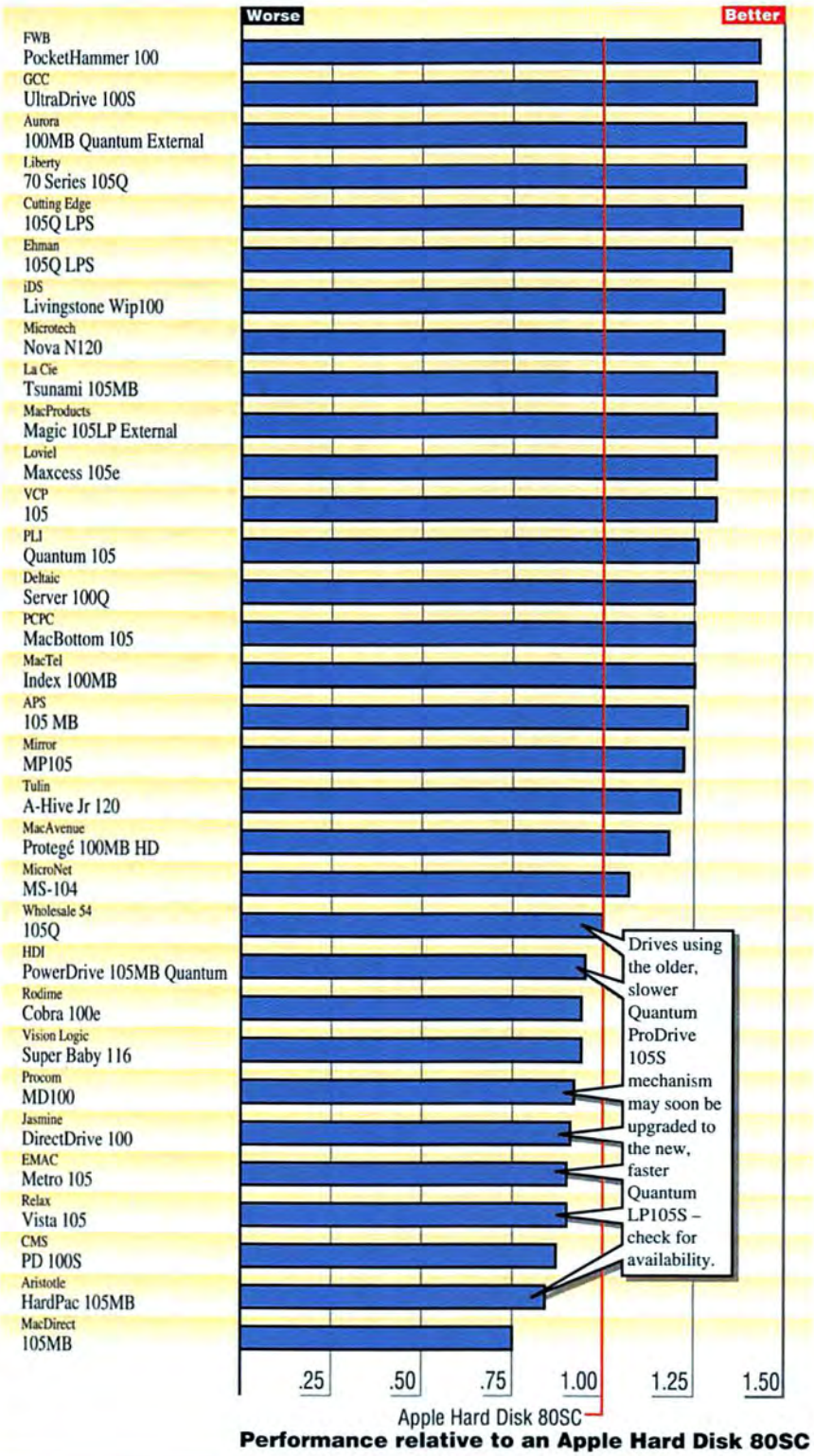


Figure 1: Along with the Mac's central processor, a hard drive is the component that has the greatest effect on your Mac's speed. A drive's speed depends on several factors, so we ran tests to compare SCSI throughput; read, seek, and write times; and file-transfer times. We performed our benchmark tests on a 5-megabyte Mac IIci running System 6.0.7.

To compute overall performance, we compared each drive's three test results with those of an Apple Hard Disk 80SC, which uses a Quantum Pro 80 mechanism. The overall results show the differences in mechanism performance: The Quantum LP105S was the fastest in our tests. Speed differences among drives with the same mechanism are due to the relative efficiency of each vendor's driver software. The FWB PocketHammer 100 — with the best combination of a fast mechanism and excellent driver software — finished on top. The slowest drive was the MacDirect 105MB, which uses a Fujitsu mechanism.

Realistically, you don't have the time or resources to conduct such an extensive evaluation, even if you're buying dozens of drives for your company or workgroup. That's why we've done the work for you. We asked 32 hard-drive vendors to supply MacUser Labs with an external 100-megabyte hard drive — if they sold more than one drive in the 100-megabyte range, they chose which model to send. We tested. We disassembled. We evaluated. We compared. We surveyed. We amassed enough facts to separate the bargains from the heartaches.

But there's one bit of analysis we couldn't do for you. Only you can decide what's most important to you when you choose a drive: Are you looking for the fastest drive, with price no object? Are you looking for the least expensive way to put 100 megabytes on your desktop? Do you care about what software is bundled with the drive? Or is a long-lasting warranty a must and experienced, responsive technical support a necessity? Different buyers have different requirements, but no matter what your needs, we can help. We've tabulated, sorted, and cross-referenced results based on speed, price, package, and service and discovered some good news for every hard-drive buyer.

Buying Bytes

Although we found 32 vendors offering drives in the 100-megabyte range, all their mechanisms come from only six OEMs (original equipment manufacturers). Remarkably, 27 of the drives use Quantum mechanisms: the fast new LP105S or the older ProDrive 105S or ProDrive 120S.

The Quantum ProDrive 120S-based drives potentially offer 15 more megabytes of storage than drives using the 105-megabyte Quantum mechanisms. When shopping for drives, however, compare formatted capacities only — never rely solely on vendors' specifications — because the driver software used to format the drive often leaves several megabytes unused. For the most part, however, advertised drive capacities closely approximate their formatted ones.

A couple of the non-Quantum drives — the 109-megabyte CMS PD 100S, which uses the Seagate ST1126N mechanism, and the 116-megabyte Vision Logic Super Baby 116, which uses the Conner CP30100 — also offer a bit more storage. The three other non-Quantum drives — the MacDirect 105MB (Fujitsu M2616SA), the MicroNet MS-104 (Toshiba MK234), and the Rodime Cobra 100e (Rodime RO3128TS) — offer roughly the same storage capacity as the 105-megabyte Quantum models.

The most significant difference among mechanisms is speed. Our tests showed that there's a simple reason why most drive manufacturers use the Quantum LP105S mechanism: It's the fastest. In fact, most — if not all — of the vendors that sent us a drive with an older ProDrive 105S mechanism will be using the LP105S mechanism by the time you read this. Our other conclusions on package, warranty, and service will still hold, however.

Be aware that some vendors vary the OEM mechanisms to suit customer requests, market price, or availability. Be sure to specify the mechanism you want when you order your drive. If a vendor isn't willing to commit to providing it, look elsewhere. If you're still not sure which mechanism the drive has when you get it, you can use Robert Polic's shareware program SCSI Probe (available on Zmac) to find out without opening the case and voiding the warranty.

You may also want to relate the price of a drive to the amount of storage you're getting. To ascertain which drives offer the most bytes for the buck, simply divide capacity by price. MacUser Labs contacted a sampling of dealers throughout the U.S. to determine the average — not necessarily the lowest — street prices of the drives we tested. Of the 32 drives, 15 are available directly from the manufacturer only, so the list price and the street price are the same. We found that manufacturers selling directly to customers usually offer the best prices, even though street prices for drives sold through dealers range from 15 to 35 percent below suggested retail.

With a direct price of $389, the Wholesale 54 105Q is both the least expensive drive and the best buy on a kilobytes-per-dollar basis — you get a hefty 276K of storage space for every

Figure 2: The Classic Handicap

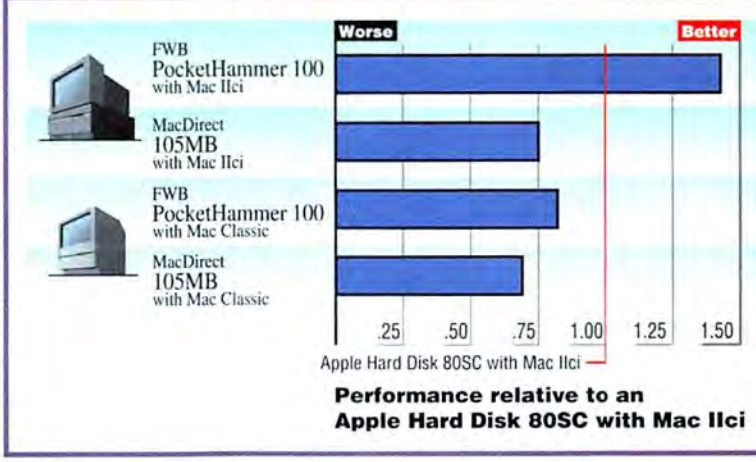


Figure 2: You should consider the type of Mac you'll use with a drive. A slow Mac can severely handicap a fast drive. With a IIci, the FWB PocketHammer 100 was almost twice as fast as the MacDirect 105MB in our tests. When we ran our benchmarks on a Mac Classic, the PocketHammer was only 16 percent faster than the MacDirect drive.

dollar. Other bargains include the HDI PowerDrive 105MB Quantum, the MacTel Index 100MB, and the Relax Vista 105. On the other hand, the premium-priced Liberty 70 Series 105Q, the FWB PocketHammer 100, and the La Cie Tsunami 105MB provide about 100K per dollar — roughly $10 per megabyte at street prices.

Speed Freaks

For many buyers, speed is the all-important attribute of a hard-disk drive. This is a reasonable opinion, because aside from the central processing unit, your hard drive is the component that most affects the speed of everyday operations on your Macintosh. Because a drive's overall speed depends on several factors — throughput, seek time, caching, and command overhead — we performed tests that focused on each aspect individually.

Our primary benchmark platform was a 5-megabyte Mac IIci running System 6.0.7. Each hard drive was formatted at a 1:1 interleave with the vendor's own software. Because all

Figure 3: Price and Speed

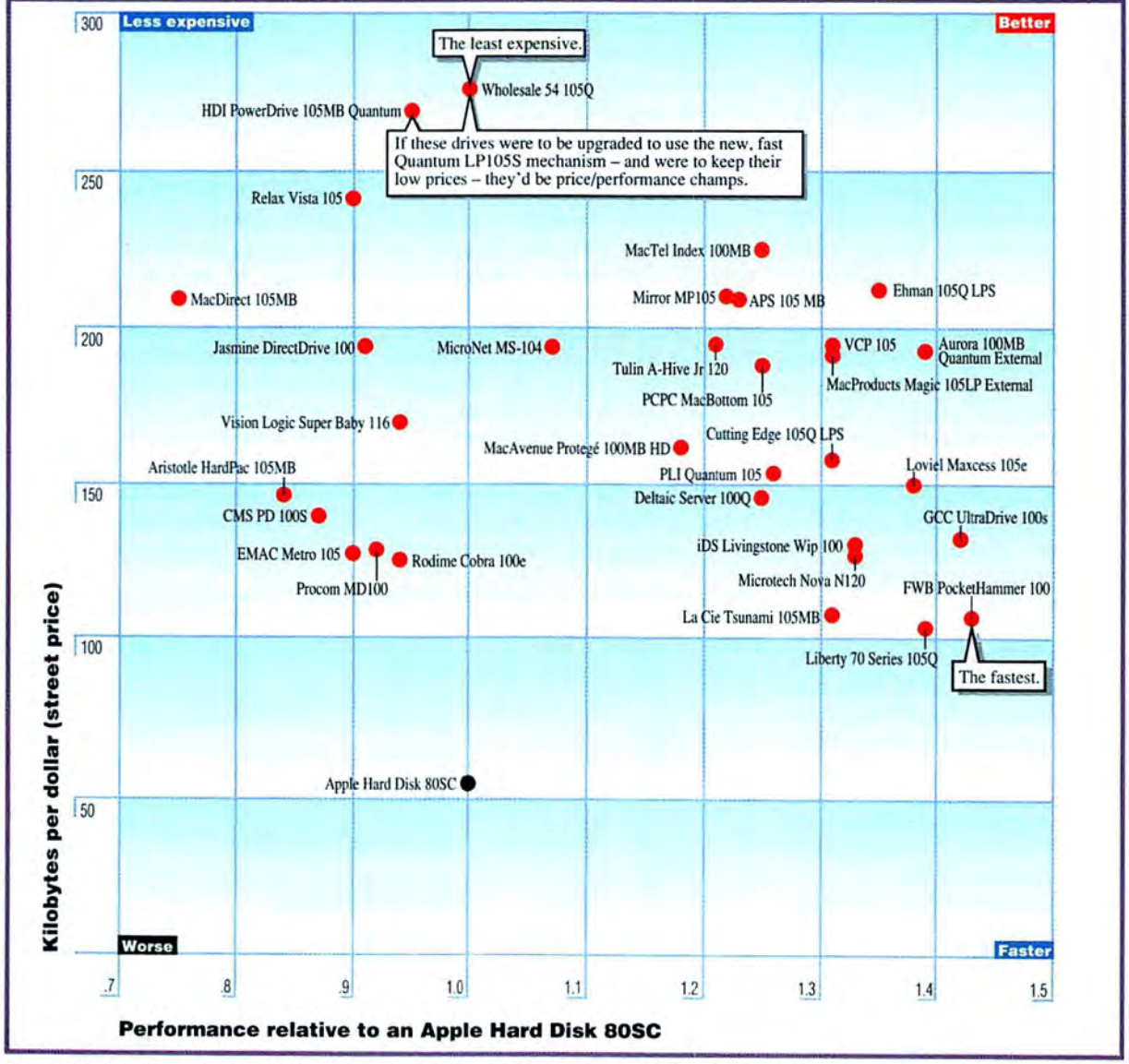


Figure 3: If all you care about is a 100-megabyte hard drive's price and speed — and not its warranty, construction quality, software, or vendor's reputation — then simply compare its overall performance with the number of kilobytes it provides per dollar. The Ehman 105Q LPS offers the best combination of low price and high performance. At the other end of the spectrum are six drives that are either slow, expensive, or both: the MacDirect 105MB, Aristotle HardPac 105MB, CMS PD 100S, Procom MD100, EMAC Metro 105, and Rodime Cobra 100e. The Apple Hard Disk 80SC is sluggish as well as expensive — its list price is a hefty $1,749.

these drives contain buffers large enough to hold the data from an entire track, a 1:1 interleave is appropriate for all Mac models.

If you work primarily with large files, a drive's throughput is an important consideration. To measure how quickly data could be passed between the drive and our test IIci, we used William Long's shareware utility SCSI Evaluator 1.07 (available on Zmac). Drives based on the Quantum LP105S mechanism consistently came out on top, being an average of 25 percent faster than drives with competing mechanisms and almost twice as fast as the bottom-ranked MacDirect 105MB, which uses the Fujitsu M2616SA (see Figure 1).

To test real-world speed, we used DiskBasher, a utility developed by MacUser Labs to simulate a typical application's interaction with a hard drive. DiskBasher creates a single contiguous file and performs sequential write, seek, and read operations within that file. DiskBasher results also showed that the Quantum LP105S drives were the fastest.

Finally, we timed each drive as the Finder duplicated a 13-megabyte TIFF file, a task that requires the read/write heads to move repeatedly back and forth over very short distances. This test highlights the differences in software drivers among drives using the same mechanisms. For example, although they both use Quantum LP105S mechanisms, the FWB PocketHammer 100 managed to copy the test file 35 percent faster than did the MacAvenue Protegé 100MB HD. The folks at FWB have developed driver software that squeezes every ounce of performance out of the already fast Quantum LP105S mechanism.

Before you rush out to buy the fastest drive you can find, consider the Mac model to which it'll be connected. Ideally, you want a drive that spins off its information as fast as your Mac can use it. Not all SCSI ports are created equal: The fastest, on the IIci, can handle as much as 2.1 megabytes per second. Most other members of the Mac II family top out at about 1.4 to 1.7 megabytes per second — surprisingly, the otherwise speedy IIfx can do no better than 1.5. As you step down the Mac evolutionary ladder, SCSI gets slower and slower: The Mac Classic and SE can do no better than around 650K per second, and the Mac Plus is positively pokey at a bit more than 250K per second. Your Macintosh won't choke if you hook up a faster drive, but you might be wasting money on performance you'll never be able to use.



Figure 4: Eight of the drives in this report are small enough to fit into your briefcase (outside, clockwise from top: Aristotle HardPac 105MB, Vision Logic Super Baby 116, Tulin A-Hive Jr 120, La Cie Tsunami 105MB, Liberty 70 Series 105Q, FWB PocketHammer 100, and Loviel Maxcess 105e; center: iDS Livingstone Wip100). All you need is a power cord and a SCSI cable. Three of the drives — the Aristotle HardPac 105MB, the iDS Livingstone Wip100, and the Vision Logic Super Baby 116 — take power from the Mac's floppy port.

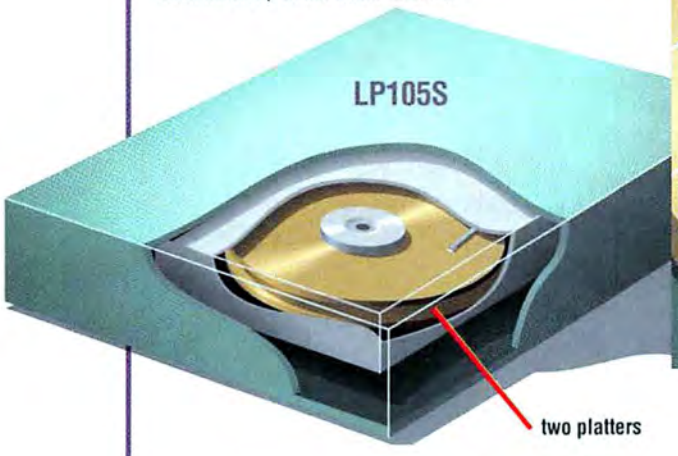
To demonstrate this phenomenon, we retested the fastest and the slowest drives — the FWB PocketHammer 100 and the MacDirect 105MB, respectively — with a Mac Classic. Whereas the FWB PocketHammer 100 was almost twice as fast as the MacDirect 105MB when hooked up to a IIci, it was a mere 16 percent faster when both were limited by the Classic's slow SCSI port (see Figure 2).

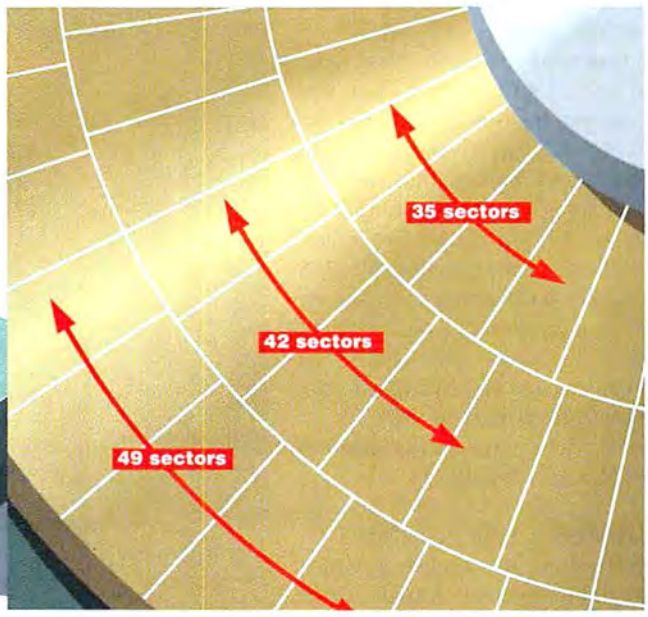
If all you care about is price and speed — and you're willing to ignore a drive's warranty, quality of construction, and bundled software and the vendor's reputation — then your choice is easy: Just look at each drive's "bang for the buck" (see Figure 3).

We plotted each drive's performance against its kilobyte capacity per dollar and discovered that good performance and low prices were enough to propel the Ehman 105Q LPS to the top of the heap. Six drives came close to the 105Q LPS's stats: the APS 105 MB, Aurora 100MB Quantum External, MacProducts Magic 105LP External, MacTel Index 100MB, Mirror MP105, and VCP 105. Conversely, six other drives — the Aristotle HardPac

How It Works: Quantum Evolution

The heart and soul of any hard-disk drive is its *mechanism* — the collection of disks and read/write heads that shares the case with a power supply, SCSI connectors, a SCSI-ID switch, a fuse, and an AC plug. The fastest mechanism used in 100-megabyte hard drives — and our favorite — is the Quantum LP105S, successor to the former champ, the Quantum ProDrive 105S, which is still used by a few vendors. We expect most — if not all — vendors to soon move up to the faster LP105S.



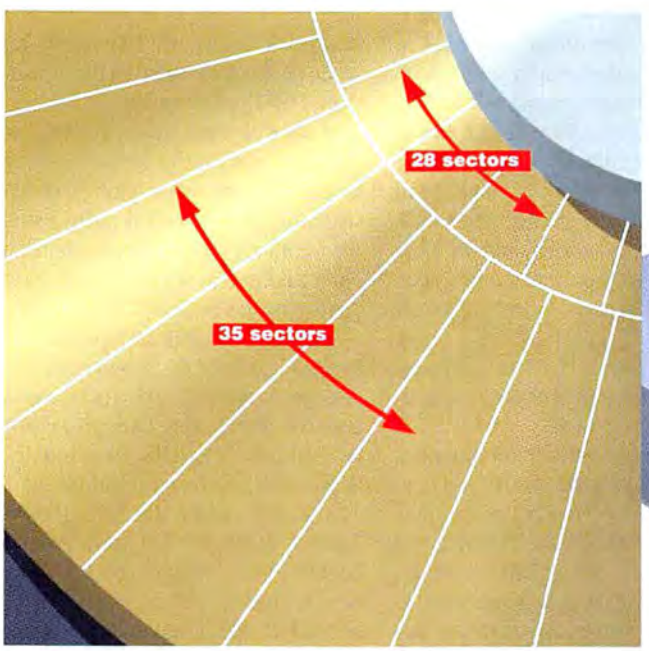


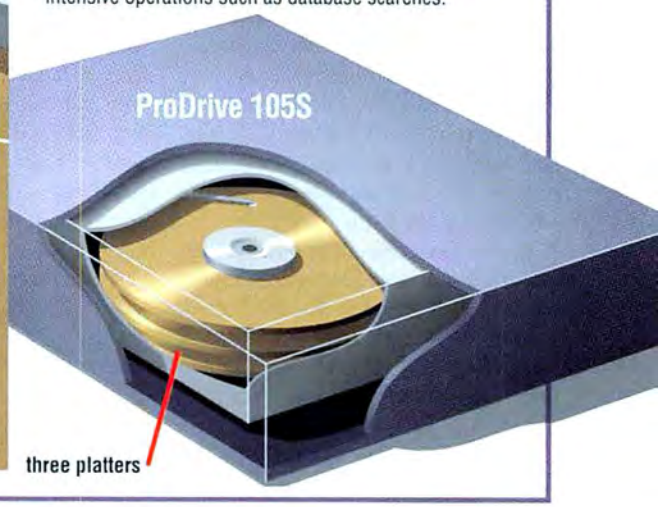
	Sectors per Track			Spindle Rotation	Seek Time
	outer	middle	inner		
LP105S	49	42	35	3,600 rpm	17 ms
ProDrive	35	NA	28	3,600 rpm	19 ms

To gain its speed advantage over the ProDrive 105S, the LP105S combines a higher density with a faster read/write mechanism. The LP105S stores the same amount of data as the ProDrive 105S, but it uses only two platters and four heads instead of the three platters and six heads the ProDrive 105S does.

In each mechanism, every magnetic platter is divided into logical sectors. Each sector holds 512 bytes of data. The sectors are arranged in concentric circles called tracks. The LP105S packs more sectors into each track.

Because the LP105S packs data more densely than the ProDrive 105S, it can read data 20 to 30 percent faster than the older mechanism — even though both mechanisms' platters rotate at the same rate. The LP105S' faster seek time also results in 10-percent-faster operation for seek-intensive operations such as database searches.





105MB, CMS PD 100S, EMAC Metro 105, MacDirect 105MB, Procom MD100, and Rodime Cobra 100e — were hampered by either below-average speed or above-average pricing.

Construction Deduction

Whereas the mechanism used in a drive determines its speed, the construction and design of the external case and internal components are crucial to a drive's ease of installation and longevity.

An important design consideration is the drive's *footprint* — the area a drive takes up on your desk. The most common drive design is *zero footprint,* which is designed to fit under a Mac Classic, Plus, SE, or SE/30. Twenty-three of the drives are this size. With Mac modular computers such as the IIfx, IIci, IIsi, and LC, you won't slide your hard drive under your Mac. Zero-footprint designs do, however, let you stack multiple SCSI devices on top of each other, which is a convenient way for a hard drive and a CD-ROM drive to occupy the same precious desk space.

A relatively new trend in hard-drive design is portability, providing a convenient way of toting your files, your customized desktop, and all your preferences with you on business trips or from office to home. Eight of these drives are compact enough to fit in your briefcase (see Figure 4).

All the hard-disk drives reviewed this month are external SCSI devices that attach to the DB-25 SCSI connector on the back of all Macs since the Plus. The SCSI standard lets you connect as many as seven devices — hard drives, scanners, printers, and so on — in a daisy chain, with each device plugged in to the back of the next one. SCSI devices usually use DB-50 connectors, which are preferable to DB-25s because of their superior grounding.

Each device must be assigned a unique *SCSI-ID number,* and the devices on both ends of the daisy chain must be *terminated.* Resolving SCSI-ID conflicts is relatively simple, even though vendors differ in how they let you set SCSI-ID numbers. The choices include mechanical settings such as DIP or rotary switches, push buttons, and thumb wheels. DIP switches (used only on the La Cie Tsunami 105MB among the drives we tested) are a nuisance, because you must interpret their binary settings. In general, external ID switches — push buttons, thumb wheels, and rotary switches — are best, because you can see the current ID setting at a glance.

More problematic is the SCSI requirement that devices at both ends of the daisy chain be terminated (see "A Beginner's Guide to Daisy Chains," August '90, page 243). Termination — whether done internally or by the installation of a separate external termination plug — ensures that all signal voltages fall reliably within the right range and prevents signal reflections from appearing on the SCSI lines. It sounds very precise and technical, but actually SCSI termination is a black art that keeps even the experts arguing about the best approach.

All drive mechanisms have removable terminating resistors, and some of the drives come with them still installed. Thankfully, most vendors of internally terminated drives provide access windows in the bottom of the drives' case, so you don't need to disassemble the entire case should you have to remove the internal terminators. The MacTel Index 100MB, unfortunately, doesn't give you access to the internal terminators — an unnecessary annoyance.

We recommend drives from which the vendor has removed the mechanism's internal terminating resistors. If you need to add termination, you can slide a terminating plug into the last connection in the SCSI chain — simple and effective, and you can easily tell whether it's installed or not. La Cie and PLI take one step closer to perfection by providing built-in SCSI termination that can be switched on or off.

We disassembled every drive to evaluate overall construction quality. Our final mouse ratings took design, workmanship, component choice, and wiring into account. We believe that the care taken in the manufacture of a hard-disk system pays off in longer, more reliable life, so we formed our conclusions about quality accordingly.

At Your Service

Unlike speed, which MacUser Labs can accurately measure with a suite of benchmarks, it's impossible to empirically test the long-term reliability of drives. So we did the next-best thing: We investigated the service offered by each of the 32 vendors (see Table 1) when their drives prove less than perfect.

All but 9 vendors ship their drives with a 30-day money-back guarantee. Warranty periods vary from the common one-year to the truly generous five-year warranty offered by Microtech. Many vendors sell optional extended warranties, and of these, Aurora's extra coverage is the least expensive, at only $50 for five years. CMS, on the other hand, charges a hefty $249 for each year beyond its basic one-year warranty.

If something goes wrong with your drive, it's comforting to know that help is just a phone call away. Although all the vendors we surveyed operate technical-support hot lines, only 15 provide toll-free support.

If a problem requires you to return the drive for service, consider where you must send it and how long it will be before you get it back. If you buy a drive from a mail-order vendor, you must usually ship the drive directly to the vendor. One of the benefits of buying retail is that you can return the drive to the dealer for repair. Keep in mind, however, that most dealers lack adequate repair facilities and simply ship the drive back to the manufacturer. Some dealers make no promises about turnaround time, although most try to return your drive to you within two or three working days.

Perhaps the most important service consideration is whether the vendor will attempt to recover your data or

Table 1: Service and Warranty

	Standard warranty	Extended warranty	Money-back guarantee	Toll-free support	Service center	Guaranteed turnaround	Data recovery
APS 105 MB	2 years	none	30 days	yes	direct	48 hours	$150/2 hours
Aristotle HardPac 105MB	1 year	none	30 days	no	direct	none	free
Aurora 100MB Quantum External	2 years	$50/5 years	30 days	yes	direct	48 hours	free
CMS PD 100S	1 year	$249/year	none	no	dealer	24 hours	none
Cutting Edge 105Q LPS	2 years	none	30 days	no	dealer	none	none
Deltaic Server 100Q	2 years	$150/3 years	30 days	yes	direct	72 hours	free
Ehman 105Q LPS	2 years	none	30 days	no	direct	none	none
EMAC Metro 105	2 years	none	none	no	dealer	72 hours	none
FWB PocketHammer 100	2 years	$104/year	none	no	dealer	72 hours	free
GCC UltraDrive 100S	2 years	$129/year	30 days	yes	dealer	48 hours	$50
HDI PowerDrive 105MB Quantum	2 years	$36/year	30 days	yes	direct	48 hours	none
iDS Livingstone Wip100	2 years	$199/5 years	30 days	yes	direct	72 hours	none
Jasmine DirectDrive 100	2 years	$175/5 years	30 days	yes	direct	72 hours	none
La Cie Tsunami 105MB	3 years	$100/5 years	30 days	yes	direct	72 hours	$125 minimum/ $250 maximum
Liberty 70 Series 105Q	2 years	none	30 days	no	direct	48 hours	$60/hour
Loviel Maxcess 105e	2 years	$159/year	30 days	no	dealer or direct	48 hours	free
MacAvenue Protegé 100MB HD	2 years	none	30 days	yes	direct	72 hours	none
MacDirect 105MB	3 years	none	30 days	yes	direct	48 hours	free
MacProducts Magic 105LP External	2 years	$100/year	30 days	no	direct	48 hours	free
MacTel Index 100MB	2 years	none	30 days	no	direct	24 hours	free
MicroNet MS-104	1 year	$129/year	none	no	dealer or direct	48 hours	none
Microtech Nova N120	5 years	none	none	yes	direct	48 hours	free
Mirror MP105	2 years	$140/3 years	30 days	no	direct	48 hours	$217
PCPC MacBottom 105	2 years	$120/year	none	no	dealer or direct	48 hours	$40
PLI Quantum 105	1 year	$90/year	30 days	yes	dealer or direct	none	free
Procom MD100	1 year	$50/year	none	no	dealer	48 hours	none
Relax Vista 105	2 years	none	30 days	no	direct	48 hours	none
Rodime Cobra 100e	1 year	none	none	no	direct	48 hours	none
Tulin A-Hive Jr 120	2 years	$25/year	none	no	direct	48 hours	$100/hour
VCP 105	2 years	none	30 days	yes	direct	48 hours	none
Vision Logic Super Baby 116	1 year	$50/year	30 days	yes	direct	72 hours	none
Wholesale 54 105Q	2 years	$35/year	30 days	yes	direct	72 hours	none

Table 1: Service should not be judged only by the length of a drive's warranty. Also consider the cost of a warranty extension, the availability of a money-back guarantee and phone support, the location of the repair service, repair turnaround time, and whether the vendor offers data-recovery services.

will simply swap out faulty mechanisms. Although nobody can guarantee 100-percent success at recovering data from a damaged disk, many common problems can be resolved easily with the help of a good utility program such as Symantec's SUM II or Norton Utilities for the Macintosh (see "Surviving the Crash: Hard-Disk Recovery," April '91, Buyer's Guide page 42). Vendors that offer data-recovery services (and at least half of them do) often attempt recovery only at the customer's request and expense. Based on your data's value, you must determine when data recovery becomes a cost-prohibitive option. Although it's been said a thousand times, the best preventive measure is to back up often.

Aurora and GCC offer comprehensive service plans: two-year warranties backed by 30-day guarantees, optional extended warranties, toll-free support, 48-hour guaranteed turnaround, and data-recovery services. Microtech also offers an impressive service package, with a five-year standard warranty, toll-free support, 48-hour guaranteed turnaround, and free data-recovery service — if only it would add a money-back guarantee, it would win the service award hands down.

At the other end of the service spectrum is Rodime Systems. It warrants the Cobra 100e for a single year and offers no extended warranty, no money-back guarantee, no toll-free support, and no data-recovery service.

Given the lofty $1,499 list price of the Cobra 100e, you deserve more service for your money.

Software Bundles

Many vendors sweeten their deals with free software. Bundled software runs the gamut from multiple megabytes of shareware to well-chosen commercial applications that normally retail for hundreds of dollars. Aurora, GCC, iDS, Jasmine, La Cie, MacProducts, MacTel, Mirror, and PLI, among others, pack their drives with megabytes of shareware, public-domain, and demoware programs (see Table 2). If you're new to the Mac and need to build a software library, these loaded drives can give you a head start.

Other vendors include attractive utilities for such things as password protection and data encryption. Disk optimizers such as PLI's Turbo Optimizer and the optimization feature of La Cie's Silverlining improve performance by reorganizing disk contents into contiguous blocks so that the read/write heads needn't roam the disk looking for fragments of files. Backup software such as BackMatic and Turbo Back copies files from the hard disk to another medium for safekeeping. Finally, file-recovery utilities such as Mac Tools Deluxe, 911, Norton Utilities, and SUM II can rescue deleted or damaged files.

Hard Choices

This report, like all others before it and to come, is a snapshot in time, fixing the known universe of 100-megabyte hard drives just long enough for us to test the products. But new drives appear on the market almost daily, and vendors upgrade from older mechanisms to newer, faster ones almost as often. Even with all the data we've compiled on the current crop of 32 hard drives, making the right selection is difficult. You must balance your needs against your means; make trade-offs between value and speed; and consider a host of intangibles such as construction quality, aesthetics, and the vendor's reputation. There's no "best" drive for every application; check out the "Bottom Line" sidebar for our recommendations.

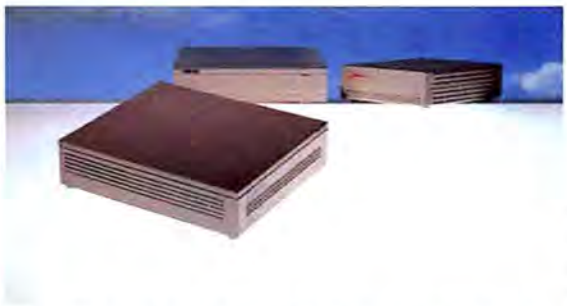
Owen W. Linzmayer is a free-lance writer living in San Francisco with his wife, two cats, and Mac IIci. He frequents Zmac and can be reached via CompuServe at 72511,70.

The Bottom Line

When shopping for a 100-megabyte hard drive, consider a drive's speed, value, service and warranty, construction quality, and special features such as portability. When we finally sorted through our mountain of data, one drive — the **GCC UltraDrive 100S** ($829 list, $769 street) — had the best overall combination of ingredients. This fast Quantum LP105S-based drive is a little pricier than most, but GCC offers a strong service plan and bundles an assortment of useful software packages.

Two other drives also offer an excellent combination of value, speed, service, and package. The **Mirror MP105** ($497 direct) is an inexpensive, well-packaged way to get a fast Quantum LP105S with good service and warranty. The **Loviel Maxcess 105e** ($799 list, $650 street) is a bit more expensive, but you also get portability and Symantec's highly rated Norton Utilities for the Macintosh.

Six drives give you a good combination of price and speed but slip slightly in service or packaging: The **Ehman 105Q LPS** ($489 direct) offers the best price/performance ratio, but it has minimal software and limited service. The **Aurora 100MB Quantum External** ($736 list, $536 street), **MacTel Index 100MB** ($459 direct), **VCP 105** ($529 direct), **MacProducts Magic 105LP External** ($539 direct), and the **APS 105 MB** ($499 direct) follow closely behind the Ehman drive. Each of these drives has one or two minuses, however: minimal service, poor construction, or no software bundle. But if you already have all the software you need and a dedicated MIS department or if you're technically savvy, one of these drives is the best choice.



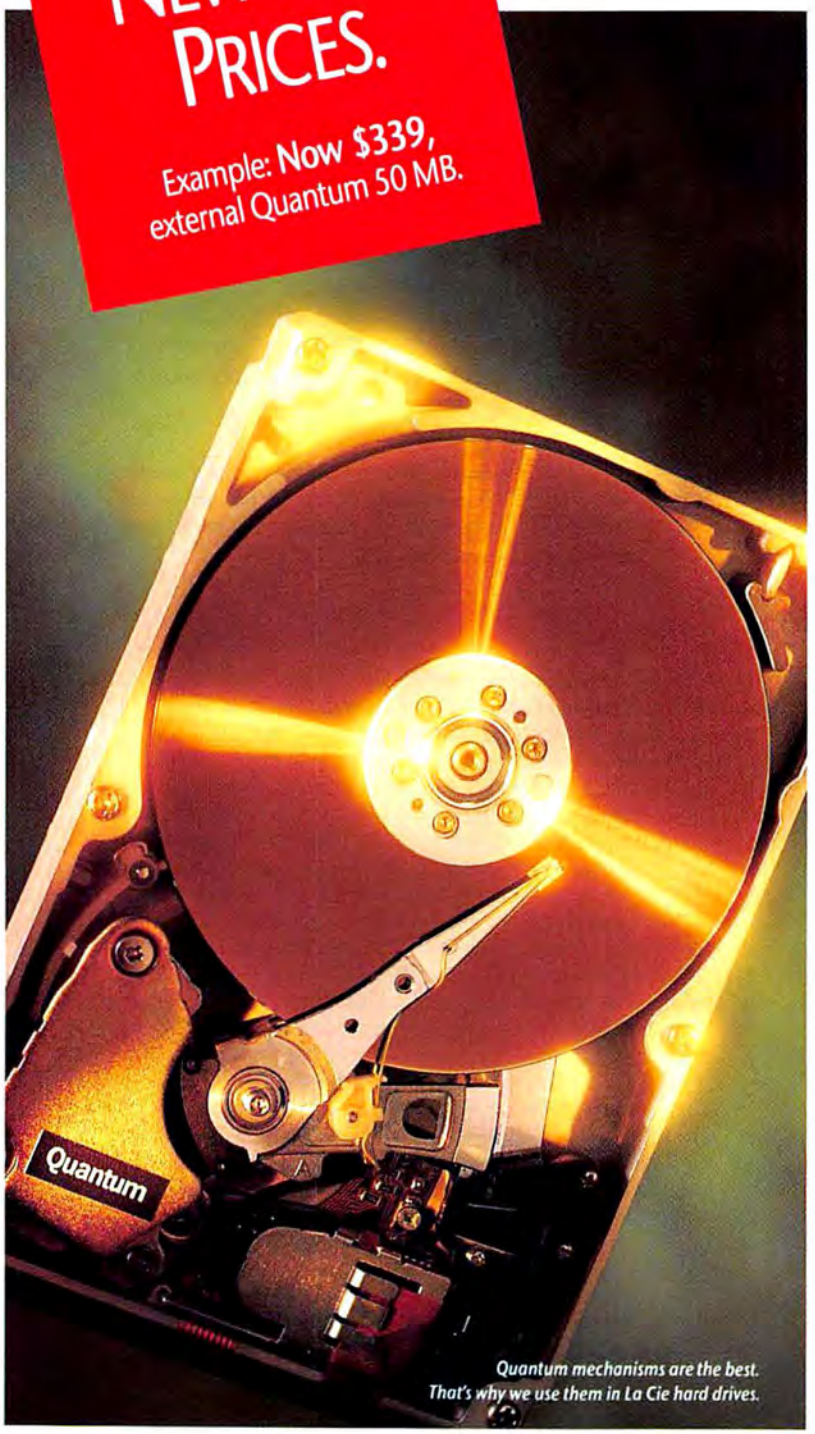
Three 100-megabyte hard drives offer the best combination of speed, price, warranty, features, software, and service (clockwise from bottom): the GCC UltraDrive 100S, the Mirror MP105, and the Loviel Maxcess 105e.

Three drives that come with stiffer sticker prices also deserve mention. If your bottom line is speed, the **FWB PocketHammer 100** ($1,299 list, $949 street) is the drive for you — if you're willing to pay the price. The software wizards at FWB have tweaked the PocketHammer 100's driver to squeeze every drop of performance out of its quick Quantum LP105S mechanism. The PocketHammer is also compact and portable. The **La Cie Tsunami 105MB** ($949 direct) is a fast portable drive with a unique art-deco design and comes bundled with Norton Utilities and 10 megabytes of shareware. The Tsunami has a convenient external termination DIP switch but — alas — also uses DIP switches to set the SCSI ID. The **Microtech Nova N120** ($1,249 list, $919 street) is expensive, but you get more storage space with a Quantum ProDrive 120S mechanism: It comes with Norton Utilities and an impressive five-year standard warranty.

For budget-conscious consumers looking for the most bytes per buck, the **Wholesale 54 105Q** ($389 direct) and the **HDI PowerDrive 105MB Quantum** ($399 direct) are the best bets. Each of these no-frill drives uses the somewhat slow Quantum ProDrive 105S mechanism and comes only with Ontrack's Disk Manager Mac software. But as a second drive, a backup unit, or a font-storage device for your laser printer, these drives can alleviate your growing pains without hurting your bank account. And if Wholesale 54 and HDI were to offer the faster Quantum LP105S mechanisms and maintain their drives' low prices, these drives would definitely be best buys.

NEW LOW PRICES.

Example: Now $339, external Quantum 50 MB.



SIX REASONS WHY LA CIE HARD DRIVES ARE THE BEST YOU CAN BUY.

1

A Quantum Difference.

Quantum drive mechanisms offer blazing-fast effective access time as low as 8 milliseconds.* No other drive mechanisms in their class (Mac-compatible) run faster, which is why they are in La Cie drives.**

*Typical application access time using 64KB DisCache®
**Seagate drive mechanisms also available (capacities from 300MB to 1.2GB).

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2

Software with a Silverlining.

Every La Cie drive includes a FREE copy of Silverlining, the #1-rated hard drive management utilities program.

Silverlining drivers can get 30% more speed from a drive than the competition. It works with any true SCSI drive, internal or external. So one program can manage it all. Plus, Silverlining optimizes your data so it's consecutive on your drive, which makes your applications run faster.



MacUser says, "Silverlining is one of the most powerful and useful hard disk utilities you can find—most Apple engineers prefer it to Apple's own."

And unlike traditional utilities programs, Silverlining lets you create your own partitions. You can even re-size them to suite your needs, and you'll save time because there's no need to re-initialize.

Silverlining drivers are also intelligent. They test the drives' functionality at start-up to ensure that everything is working properly. If it's not, it protects you.

Sold separately, Silverlining software costs $149. But it's ABSOLUTELY FREE when you buy any La Cie drive.

3

A Company You Can Count On.

La Cie is a Plus Development Company (makers of the Hardcard XL), backed by $400 million in assets. That means you can trust La Cie to provide a constant source of high-quality mechanisms and components. And you can be certain that we'll be around to help you with service and support. For a long, long time.

4

The Most Unusual Warranty in the Business.

La Cie features up to a 5-YEAR LIMITED WARRANTY† on all its Quantum Mechanisms. So, If anything goes wrong with the mechanism of your hard drive, we'll repair or replace it within 48 hours.



And every La Cie drive is backed by toll-free support from customer service and technical assistance experts.

5

Award-Winning Design.



Hard drives that win design awards? Who says intelligence has to be ugly? The Tsunami and Cirrus hard drives have received prestigious awards from both the industrial design and computer communities.

La Cie drives are designed from the inside out. Designed to be quiet (with a 1/2 speed fan), lightweight (as light as 2 1/2 lbs.), durable and reliable. Plus, they have an external termination and SCSI address switch, which means you'll never have to open the case for any reason! You don't win awards for these features, but you do win a loyal following.

6

Rave Reviews from Critics Customers.

Frankly, there's been a lot of talk about La Cie hard drives.

Leading Macintosh consumer magazines praise us. Customers write us fan letters. In fact, we're happy to let critics and customers have the last word about La Cie drives. Because they tend to be words like these:

★★★★★ –MacUser

..."The good Housekeeping Seal. I'm now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie..." -MacWeek



La Cie offers internal and external hard drives from 40MB to 1.2 Gigabytes. Choose from the award-winning Tsunami, Cirrus, ZFP Family and Internal drives. Plus, La Cie now offers the Bacster, a hard drive that attaches directly to the back of a Macintosh Plus or SE.

AS LOW AS $299

To order or for more information, call toll-free 800-999-0143.

Volume discounts available.

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LIMITED
A PLUS DEVELOPMENT COMPANY

Table 2: Features of 100-Megabyte Hard Drives

● = yes ○ = no	APS 105 MB ★★★½	Aristotle HardPac 105MB ★★½	Aurora 100MB Quantum External ★★★½	CMS PD 100S ★★½	Cutting Edge 105Q LPS ★★★
List price	$499	$688	$736	$1,199	$849
Street price	$499	$650	$536	$800	$691
Pros	Inexpensive. Two power outlets. Good service.	Portable. Inexpensive.	Fast. Inexpensive. Good service and warranty.	Good software bundle.	Fast. Two power outlets.
Cons	No software bundle.	Second-slowest drive. 25-pin SCSI. Minimal warranty.	Poor construction. Large case.	Low price/performance ratio. Slow mechanism. Minimal warranty.	No software bundle. Minimal service.
Hardware					
Internal mechanism	Quantum LP105S	Quantum ProDrive 105S*	Quantum LP105S	Seagate ST1126N†	Quantum LP105S
Capacity (advert./actual)	105 MB/102 MB	105 MB/100 MB	105 MB/101 MB	133 MB/109 MB	105 MB/101 MB
Seek time (advert./actual)	17 ms/19 ms	19 ms/23 ms	17 ms/19 ms	18 ms/18 ms	17 ms/19 ms
SCSI-ID selector	push button	rotary switch	push button	push button	thumb wheel
SCSI termination	external	internal	external	external	internal
SCSI cable	2.5 feet, 25/50-pin or 1.5 feet, 50/50-pin	2 feet, 25/25-pin	2 feet, 25/50-pin	3 feet, 25/50-pin	2 feet, 25/50-pin
Software					
Formatter	Nuvo Labs 1.13	Disk Manager Mac 2.23	Software Architects 3.29 Rel 101	CMS Utilities 7.01	Software Architects 3.27 Rel 210
Bundled software	none	Advanced Security	5 MB shareware	SUM II	none
System 7-compatible	●	○§	●	●	●
User-selectable interleave	○	●	○	●	●
Password protection	●	●	○	●	○
Data encryption	○	●	○	●	○
Disk optimizer	○	○	○	●	○
Backup	○	○	○	●	○
File recovery	○	○	○	●	○
Case					
Fan	●	○	●	●	●
Indicator lights	access, power	access	access	access	access, power
Construction	plastic and metal	plastic	metal	metal	metal
Fuse	external	internal	external	internal	external
Other	two power outlets	powered by floppy port	NA	NA	two power outlets
Size (L x W x H, in.)	10 x 10 x 2◊	7 x 4.5 x 2	10.5 x 9.75 x 3◊	11.25 x 10 x 2.25◊	10.5 x 9.5 x 2.5◊
Weight	7 lb	2.2 lb	7 lb	6 lb	9 lb
Company	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 (800) 235-2750 (816) 478-8300	Aristotle Industries 7400 MacPherson Ave. Ste. 111 Burnaby, BC V5J 5B6 Canada (800) 663-8558 (604) 434-7274	Aurora Industries 60 Skiff St., Ste. 1011 Hamden, CT 06517 (800) 426-1591 (203) 624-9018	CMS Enhancements, Inc. 2722 Michelson Dr. Irvine, CA 92715 (714) 222-6000	Cutting Edge 97 S. Red Willow Rd. Evanston, WY 82931 (307) 789-0582

*Should be shipping the Quantum LP105S by the time you read this; check for price changes.

†Mechanism varies.

§Will soon ship with Disk Manager Mac 2.3, which will support System 7.

◊Zero-footprint case.


"The Best Value... 68030 Accelerator"
(Macworld, July 1991)
Description:
The NewLife series of accelerators gives unparalleled speed, power and productivity to the compact Macintosh. No longer will you be waiting for your machine to respond to your next command, it will work with you at your speed. Newlife has broken the price/performance barrier by utilizing custom circuits (ASIC's) and surface mount devices, the same technology Apple uses in their latest machines. With a NewLife accelerator, you will have access to 20 Megabytes of RAM on the Mac Plus™, SE™ and Classic™ utilizing low profile 4 Meg. SIMM's. To further complement these features NewLife offers an optional video adapter. This allows the user to expand to a two-page display with their accelerator.
Experience the Performance;
NewLife Accelerator Cards feature:
• Real Performance
• System 7 Compatibility
• 68030 Power and Speed
• Optional 68882 FPU
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• Memory Expansion to 20 Meg.
• Crash Resistant Bootable Ramdisk
• Optional "VIRTUAL 3.0" from Connectix
• Optional Video Adapter
For more information, contact:
NewLife Computer Corporation
603 March Road
Kanata, Ontario Canada K2K 2M5
Telephone: (613) 592-5080
Toll free: (800) 663-6395
Fax: (613) 592-9738
NewLife accelerators are unmatched!
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NewLife™
(Section of the NewLife accelerator board illustrated.)
CIRCLE 405 ON READER SERVICE CARD.
CABD design

Table 2: Features of 100-Megabyte Hard Drives, continued

● = yes ○ = no	Deltaic Server 100Q ttt½	Ehman 105Q LPS ttt½	EMAC Metro 105 ttt	FWB PocketHammer 100 tttt	GCC UltraDrive 100S tttt½
List price	$699	$489	$1,129	$1,299	$829
Street price	$699	$489	$800	$949	$769
Pros	Good service.	Fast. Inexpensive. Good price/ performance ratio.	Power switch on front panel. Good software bundle.	Fastest drive. Portable. Good package. Fast SCSI software.	Fast. Good package and service.
Cons	No software bundle. LEDs hard to see.	Minimal service. No software bundle.	Slow. Expensive. Minimal service.	Expensive.	
Hardware					
Internal mechanism	Quantum LP105S	Quantum LP105S	Quantum ProDrive 105S*	Quantum LP105S	Quantum LP105S
Capacity (advert./actual)	105 MB/100 MB	105 MB/101 MB	105 MB/100 MB	105 MB/100 MB	105 MB/100 MB
Seek time (advert./actual)	17 ms/19 ms	17 ms/19 ms	19 ms/23 ms	17 ms/19 ms	17 ms/19 ms
SCSI-ID selector	push button	thumb wheel	push button	push button	push button
SCSI termination	external	internal	external	external	external
SCSI cable	2 feet, 25/50-pin	2 feet, 25/50-pin	2 feet, 25/50-pin	1.5 feet, 25/50-pin	1.5 feet, 25/50-pin
Software					
Formatter	Deltaic System Installer 2.01	Software Architects 3.27 Rel 210	EMAC Disk Utility 3.31	Hammer Install 1.4a	GCC Drive Manager 7.0
Bundled software	none	none	Norton Utilities	Hard Disk Partition, Hard Disk Deadbolt	Mac Tools Deluxe, QuickEnvelope, QuickSpool, 3.5 MB shareware
System 7-compatible	●	●	○	●	●
User-selectable interleave	○	●	○	●	●
Password protection	○	○	●	●	●
Data encryption	○	○	○	●	●
Disk optimizer	○	○	●	○	●
Backup	○	○	○	○	●
File recovery	○	○	●	○	●
Case					
Fan	●	●	●	●	●
Indicator lights	access, power	access, power	access, power	access, power	access, power
Construction	metal	metal	plastic	metal	plastic
Fuse	external	external	internal	external	external
Other	NA	two power outlets	SCSI Sentry	NA	NA
Size (L x W x H, in.)	10 x 10 x 2.5◊	10.5 x 9.5 x 2.5◊	10 x 10 x 3◊	9 x 6.5 x 3	10.75 x 9.5 x 2.75◊
Weight	5 lb	9 lb	7 lb	3.5 lb	6.5 lb
Company	Deltaic Systems, Inc. 1701 Junction Ct. Ste. 302B San Jose, CA 95112 (800) 745-1240 (408) 441-1240	Ehman Engineering, Inc. 97 S. Red Willow Rd. Evanston, WY 82931 (800) 257-1666 (307) 789-3830	EMAC 48431 Milmont Dr. Fremont, CA 94538 (800) 821-0806 (510) 683-2222	FWB, Inc. 2040 Polk St., Ste. 215 San Francisco, CA 94109 (415) 474-8055	GCC Technologies 580 Winter St. Waltham, MA 02154 (800) 422-7777 (618) 890-0880

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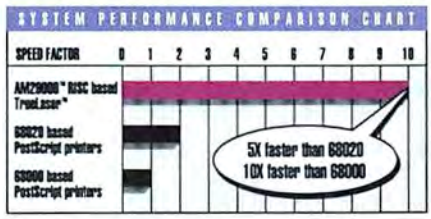


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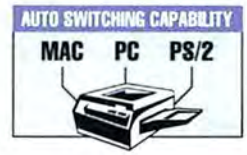
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CIRCLE 109 ON READER SERVICE CARD.

Table 2: Features of 100-Megabyte Hard Drives, continued

● = yes ○ = no	HDI PowerDrive 105MB Quantum ★★★½	iDS Livingstone Wip100 ★★★½	Jasmine DirectDrive 100 ★★★½	La Cie Tsunami 105MB ★★★★	Liberty 70 Series 105Q ★★★½
List price	$399	$999	$539	$949	$1,199
Street price	$399	$799	$539	$949	$999
Pros	Inexpensive. Low cost per megabyte.	Portable. Smallest case. Good service.	Inexpensive. Good construction.	Portable. Good software bundle. External termination switch.	Compact. Portable. Fast.
Cons	Slow. No software bundle.	Internal termination. One SCSI port.	Slow.	Expensive. SCSI-ID DIP switches. 25-pin SCSI.	Expensive. Internal termination. No software bundle.
Hardware					
Internal mechanism	Quantum ProDrive 105S*	Quantum LP105S	Quantum ProDrive 105S*	Quantum LP105S	Quantum LP105S
Capacity (advert./actual)	105 MB/105 MB	105 MB/102 MB	105 MB/102 MB	105 MB/101 MB	105 MB/102 MB
Seek time (advert./actual)	19 ms/23 ms	17 ms/19 ms	19 ms/23 ms	17 ms/19 ms	17 ms/19 ms
SCSI-ID selector	push button	rotary switch	push button	DIP switch	thumb wheel
SCSI termination	internal	internal	internal	externally switchable	internal
SCSI cable	2 feet, 50/50-pin	2 feet, 25/50-pin	2 feet, 25/50-pin	2 feet, 25/25-pin	3 feet, 50/50-pin
Software					
Formatter	Disk Manager Mac 2.25	Apple HD SC	DriveWare 1.7.9	Silverlining 5.31	Software Architects 3.29
Bundled software	none	formatter, utilities, 8 MB shareware	10 MB shareware	Norton Utilities, 10 MB shareware	none
System 7-compatible	●	●	●	●	●
User-selectable interleave	●	○	○	○	●
Password protection	●	○	●	●	○
Data encryption	○	○	○	○	○
Disk optimizer	○	○	○	●	○
Backup	○	●	○	○	○
File recovery	○	○	○	●	○
Case					
Fan	●	○	●	●	○
Indicator lights	access, power	access	access	access, power	access, power
Construction	metal	plastic	plastic	plastic	metal
Fuse	internal	none	external	internal	internal
Other	NA	powered by floppy port	two power outlets	one power outlet	NA
Size (L x W x H, in.)	10 x 10 x 2.5◊	5 x 8 x 1	10 x 10 x 2◊	8 x 6 x 2.75	7 x 2 x 5
Weight	7 lb	1.5 lb	5 lb	2.75 lb	2.5 lb
Company	Hard Drives International 1912 W. 4th St. Tempe, AZ 85281 (800) 767-3475 (602) 350-1128	iDS Livingstone Technologies 1225 Elko Dr. Sunnyvale, CA 94089 (800) 733-0078 (408) 752-2900	Jasmine Technologies 1225 Elko Dr. Sunnyvale, CA 94089 (800) 347-3228 (408) 752-2900	La Cie Ltd. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771	Liberty Systems 160 Saratoga Ave. Ste. 38 Santa Clara, CA 95051 (408) 983-1127

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CIRCLE 132 ON READER SERVICE CARD.

Table 2: Features of 100-Megabyte Hard Drives, continued

● = yes ○ = no	Loviel Maxcess 105e ★★★★	MacAvenue Protegé 100MB HD ★★★½	MacDirect 105MB ★★★	MacProducts Magic 105LP External ★★★½	MacTel Index 100MB ★★★½
List price	$799	$639	$495	$539	$459
Street price	$650	$639	$495	$539	$459
Pros	Portable. Norton Utilities bundled.	Good package. Solid construction.	Inexpensive. Good service.	Inexpensive. Good service.	Inexpensive. Good price/performance ratio.
Cons			Slowest mechanism.	No rubber feet.	
Hardware					
Internal mechanism	Quantum LP105S	Quantum LP105S	Fujitsu M2616SA	Quantum LP105S	Quantum LP105S
Capacity (advert./actual)	105 MB/100 MB	105 MB/101 MB	105 MB/101 MB	105 MB/101 MB	105 MB/101 MB
Seek time (advert./actual)	17 ms/19 ms	17 ms/19 ms	20 ms/20 ms	17 ms/19 ms	17 ms/19 ms
SCSI-ID selector	push button	push button	push button	push button	push button
SCSI termination	external	external	external	internal	external or internal
SCSI cable	3 feet, 25/50-pin	2 feet, 25/50-pin	3 feet, 25/50-pin	3 feet, 25/50-pin	2 feet, 50/50-pin
Software					
Formatter	SCSI Director 1.7.3	DK Research 2.02	Dataware 2.0	Disk Manager Mac 2.24	Index HD Utilities
Bundled software	Norton Utilities	Now Utilities, On Location	SCSI Commander	SCSI bus, StuffIt, Disinfectant, 10 MB shareware	BackMatic, AutoSave, 14 MB shareware
System 7-compatible	●	●	●	●	●
User-selectable interleave	●	●	●	●	●
Password protection	●	●	○	●	○
Data encryption	●	○	○	○	○
Disk optimizer	●	○	○	○	○
Backup	●	○	○	●	●
File recovery	●	○	○	●	●
Case					
Fan	●	●	●	●	●
Indicator lights	access, power	access, power	access, power	access, power	access, power
Construction	plastic	plastic	metal	plastic	plastic
Fuse	internal	external	external	internal	external and internal
Other	NA	NA	NA	NA	NA
Size (L x W x H, in.)	8 x 6 x 2	9.5 x 5 x 4.5	10 x 10 x 2◊	10.5 x 9.75 x 2.25◊	10 x 10 x 2.5◊
Weight	3 lb	6.5 lb	7 lb	4 lb	4.25 lb
Company	Loviel Computer Corp. 5174 W. 76th St. Edina, MN 55439 (612) 835-3553	MacAvenue 12303 Technology Blvd. Austin, TX 78727 (800) 888-6221 (512) 331-9386	MacDirect 5251 W. 73rd St. Edina, MN 55439 (800) 621-8461 (612) 832-5706	MacProducts USA 608 W. 22nd St. Austin, TX 78705 (800) 622-3475 (512) 343-9441	MacTel Technology 3007 N. Lamar Austin, TX 78705 (800) 950-8411 (512) 472-8881

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CIRCLE 107 ON READER SERVICE CARD.

Table 2: Features of 100-Megabyte Hard Drives, continued

● = yes ○ = no	MicroNet MS-104 ŧŧŧ	Microtech Nova N120 ŧŧŧŧ	Mirror MP105 ŧŧŧŧ	PCPC MacBottom 105 ŧŧŧ	PLI Quantum 105 ŧŧŧ
List price	$795	$1,249	$497	$549	$899
Street price	$550	$919	$497	$549	$699
Pros		Five-year warranty. Norton Utilities bundled.	Inexpensive. Good software bundle.	Rugged internal construction and design. Good software bundle.	External termination. Good software.
Cons	Minimal service.	Expensive.		25-pin SCSI cable permanently attached.	Minimal warranty.
Hardware					
Internal mechanism	Toshiba MK234†	Quantum ProDrive 120S	Quantum LP105S	Quantum LP105S	Quantum LP105S
Capacity (advert./actual)	125 MB/104 MB	120 MB/115 MB	105 MB/102 MB	105 MB/101 MB	105 MB/105 MB
Seek time (advert./actual)	25 ms/26 ms	15 ms/15 ms	17 ms/19 ms	17 ms/19 ms	17 ms/19 ms
SCSI-ID selector	push button	push button	push button	push button	rotary switch
SCSI termination	external	external	external	external	externally switchable
SCSI cable	3 feet, 25/50-pin	2.5 feet, 25/50-pin	1 foot, 50/50-pin	2 feet, 25/50-pin	1.5 feet, 25/50-pin
Software					
Formatter	MicroNet Utility 5.1.6	Microtech HD Formatter V 3.29 R202	DK Research 2.04	SCSITools 2.1.5-319	PLI Formatter 3.1
Bundled software	none	Norton Utilities	MediaManager, Volume Back-Up, 10 MB shareware	HFS Backup 3.5, SuperDisk Lite, Touch Base	Turbo Back, Turbo Cache, Turbo Optimizer, Turbo Spool, 16 MB shareware
System 7-compatible	●	●	●	●	●
User-selectable interleave	●	●	○	○	○
Password protection	●	○	●	○	○
Data encryption	○	○	○	●	○
Disk optimizer	○	●	○	○	●
Backup	○	○	●	●	●
File recovery	○	●	○	●	○
Case					
Fan	●	●	●	●	●
Indicator lights	access, power	access, power	access, power	access, power	access
Construction	plastic	plastic	metal	plastic	metal
Fuse	internal	external	external	internal	external
Other	NA	NA	two power outlets	NA	NA
Size (L x W x H, in.)	10 x 10 x 2.75◊	9.75 x 10.5 x 2.5◊	10.75 x 9.75 x 2.5◊	9.5 x 9.5 x 2◊	9.75 x 9.75 x 2.25◊
Weight	7.75 lb	6 lb	11 lb	4.5 lb	4.5 lb
Company	MicroNet Technology 20 Mason Irvine, CA 92718 (714) 837-6033	Microtech International 158 Commerce St. East Haven, CT 06512 (800) 626-4276 (203) 468-6223	Mirror Technologies 2644 Patton Rd. Roseville, MN 55113 (800) 654-5294 (612) 633-4450	PCPC 4710 Eisenhower Blvd. Ste. A Tampa, FL 33634 (800) 622-2888 (813) 884-3092	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 (800) 288-8754 (510) 657-2211

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CIRCLE 121 ON READER SERVICE CARD.

Table 2: Features of 100-Megabyte Hard Drives, continued

● = yes ○ = no	Procom MD100 ↕↕½	Relax Vista 105 ↕↕↕	Rodime Cobra 100e ↕↕	Tulin A-Hive Jr 120 ↕↕↕½	VCP 105 ↕↕↕½
List price	$1,199	$429	$1,499	$849	$529
Street price	$800	$429	$850	$629	$529
Pros	Good software bundle.	Inexpensive. Low cost per megabyte.	Two power outlets. Three LEDs.	Compact. Portable. Good service.	Good price/performance ratio. Inexpensive.
Cons	Slow. Expensive. Minimal warranty.	Slow.	Slow. Most expensive. Minimal warranty.		Poor documentation.
Hardware					
Internal mechanism	Quantum ProDrive 105S*	Quantum ProDrive 105S*	Rodime RO3128TS	Quantum ProDrive 120S	Quantum LP105S
Capacity (advert./actual)	105 MB/101 MB	105 MB/101 MB	126.5 MB/105 MB	120 MB/120 MB	105 MB/100 MB
Seek time (advert./actual)	19 ms/23 ms	19 ms/23 ms	18 ms/19 ms	15 ms/15 ms	17 ms/19 ms
SCSI-ID selector	rotary switch	push button	push button	push button	push button
SCSI termination	external	external	internal	external	internal
SCSI cable	3 feet, 25/50-pin	2 feet, 25/50-pin	2 feet, 25/50-pin	3 feet, 25/50-pin	2 feet, 25/50-pin
Software					
Formatter	Procom installer 2.68	DK Research 2.05	Cobra Driver 1.14	SCSI Commander 2.0	Neuron Inc. Installer
Bundled software	Virex, 911	Redux	Redux	none	none
System 7-compatible	●	●	●	●	●
User-selectable interleave	○	●	●	●	○
Password protection	●	●	●	○	●
Data encryption	○	●	○	○	○
Disk optimizer	○	●	○	○	●
Backup	○	●	●	○	○
File recovery	○	●	○	○	●
Case					
Fan	●	●	●	●	●
Indicator lights	access, power	access, power	access, power, ready	access, power	access, power
Construction	plastic	metal	plastic and metal	plastic	metal
Fuse	internal	internal	internal	internal	external
Other	NA	NA	two power outlets	NA	two power outlets
Size (L x W x H, in.)	10.25 x 9.75 x 2.25◊	10 x 10 x 2◊	9.75 x 10.5 x 2.5◊	7 x 7 x 2	10 x 9.5 x 2.25◊
Weight	7 lb	5 lb	6 lb	4 lb	5.5 lb
Company	Procom Technology, Inc. 200 McCormick Ave. Costa Mesa, CA 92616 (800) 800-8600 (714) 549-9449	Relax Technology 3101 Whipple Rd. Union City, CA 94587 (510) 471-6112	Rodime Systems, Inc. 7700 W. Camino Real Boca Raton, FL 33433 (800) 227-4144 (407) 391-7333	Tulin Corp. 2156H O'Toole Ave. San Jose, CA 95131 (408) 432-9025	VCP Computer Products 4992 E. Hunter Ave. Anaheim, CA 92807 (800) 447-6350 (714) 779-7478

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Table 2: Features, continued

● = yes ○ = no	Vision Logic Super Baby 116 tt	Wholesale 54 105Q ttt½
List price	$899	$389
Street price	$699	$389
Pros	Compact. Portable.	Lowest-priced drive. Lowest cost per megabyte.
Cons	Flimsy construction.	No software bundled.
Hardware		
Internal mechanism	Conner CP30100	Quantum ProDrive 105S*
Capacity (advert./actual)	120 MB/116 MB	105 MB/105 MB
Seek time (advert./actual)	15 ms/18 ms	19 ms/23 ms
SCSI-ID selector	push button	push button
SCSI termination	internal	internal
SCSI cable	2 feet, 25/50-pin	2 feet, 50/50-pin
Software		
Formatter	Deltaic System Installer 2.01	Disk Manager Mac 2.24
Bundled software	none	none
System 7-compatible	●	●
User-selectable interleave	○	●
Password protection	○	●
Data encryption	○	○
Disk optimizer	○	○
Backup	○	○
File recovery	○	○
Case		
Fan	○	●
Indicator lights	access	access, power
Construction	metal	metal
Fuse	internal	internal
Other	powered by floppy port	NA
Size (L x W x H, in.)	8 x 5 x 1.5	9.5 x 9.5 x 2.5◊
Weight	2.5 lb	7 lb
Company	Vision Logic, Inc. 283 E. Brokaw Rd. San Jose, CA 95112 (408) 437-1000	Wholesale 54 2415 S. Roosevelt Tempe, AZ 85282 (800) 659-0054

*Should be shipping the Quantum LP105S by the time you read this; check for price changes.

◊Zero-footprint case.

Table 2 Criteria

List price — The manufacturer's suggested retail price.

Street price — An average actual price charged by dealers around the U.S. in July 1991.

Internal mechanism — The OEM model name of the disk mechanism used in the drive. Double-check with the vendor to see if it uses different mechanisms in the same-model drive.

Capacity (advert./actual) — The advertised capacity of a drive and the actual formatted capacity (useful storage space).

Seek time (advert./actual) — The theoretical time required to move the read/write head between any two tracks on the disk, as reported by the OEM manufacturer, and the actual seek time, as reported by our SCSI Evaluator benchmark testing.

SCSI-ID selector — The method (DIP switch, rotary switch, push button, or thumb wheel) used to set the SCSI ID.

SCSI termination — The location or type of termination used by the drive.

SCSI cable — The length and type of the SCSI cable shipped with the drive.

Formatter — The software that formats the drive for use with a Mac.

Bundled software — Commercial applications, utilities, or shareware that come with the drive. Also the software that vendors have developed exclusively for their drives.

System 7-compatible — After formatting, is the drive compatible with Apple's new system software?

User-selectable interleave — Can the user specify the desired interleave ratio for the drive, or is it always automatically set by the software itself?

Password protection — Does the drive come with a method to prevent others from accessing it unless they have a password?

Data encryption — Does the drive come with a method of scrambling its contents to prevent others from accessing the data unless they have a password?

Disk optimizer — Does the drive come with a utility for reorganizing its contents into contiguous blocks to improve its performance?

Backup — Does the drive come with software that copies files from the drive to other storage media for safekeeping?

File recovery — Does the drive come with a utility for rescuing deleted or damaged files?

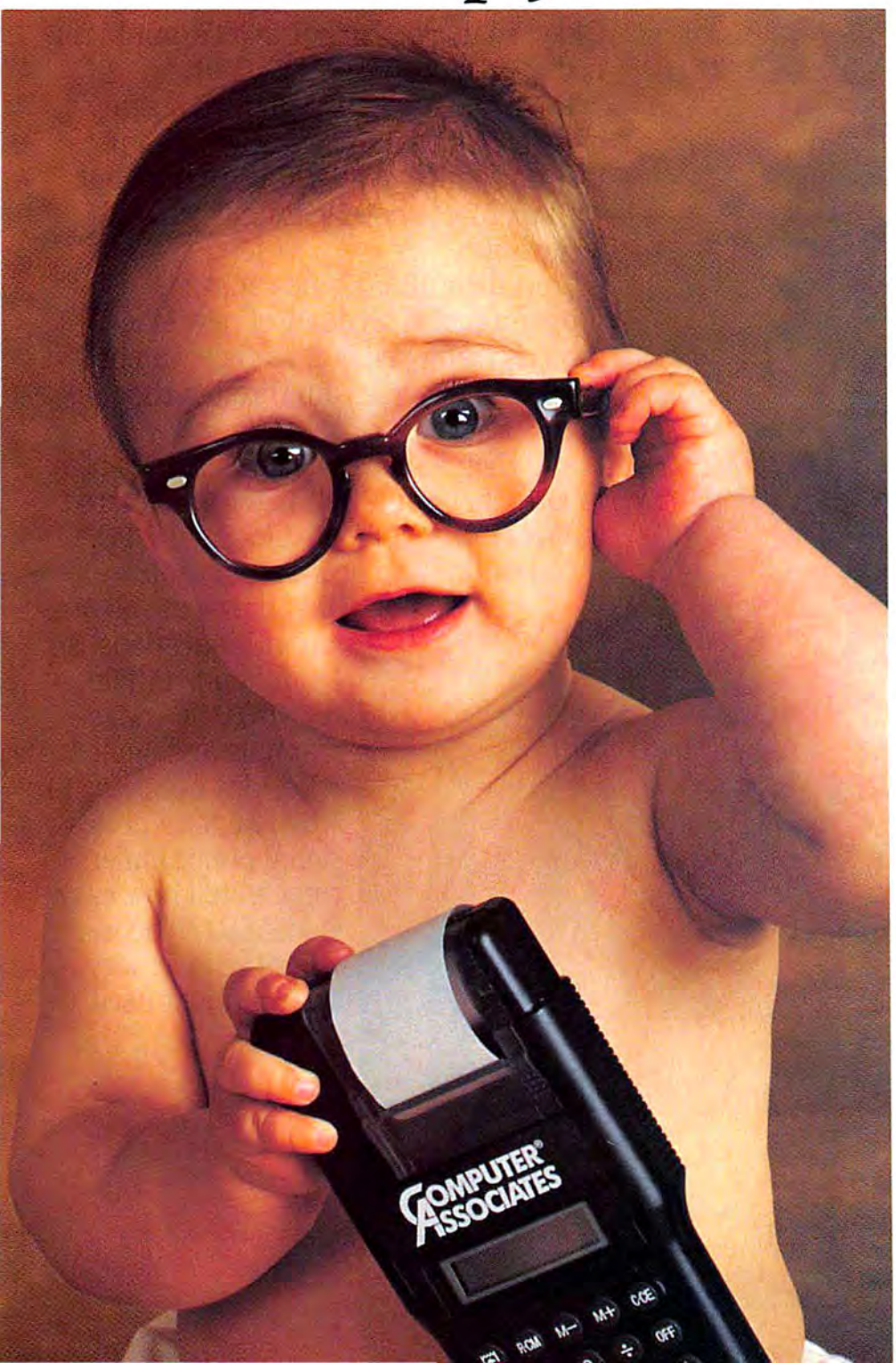
Fan — Does the drive contain a fan to keep it cool?

Indicator lights — What the lights (if any) on the drive indicate.

Construction — The primary material(s) used for the case.

Fuse — Whether the drive has an internal or an external fuse.

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CIRCLE 115 ON READER SERVICE CARD.

They laughed when database, but every



Okay, so maybe I'm not in MIS, but I grinned and loaded FoxBASE+/Mac.

The next day, I showed them a sample of their PC inventory database with not just how much of anything we had, but with pictures showing exactly what it looked like.

I ran their dBASE sales analysis program (using a couple of new Mac screens I whipped out) as they watched FoxBASE+/Mac scream through the numbers.

And then I showed them the kinds of reports they could get, using data stored in Fox or dBASE IV/III+ files on the PC.

You could have heard a pin drop.

Then they were all over me with questions, so I just handed them the FoxBASE+/Mac manuals and smiled.

Besides not being in MIS, I'm not a professional programmer, so you can tell how easy FoxBASE+/Mac is.

For the inventory system, I just used



I brought in my own one's smiling now.

FoxBASE+/Mac to read the database files they had on the PC (it reads Fox and dBASE IV/III+ files directly). I added a memo field into which I cut and pasted pictures that our DTP department had for our customer literature. Then I used the MacDraw-like screen painter to create a great color Mac output screen.

The sales analysis was easy, too. I had to create new screens but FoxBASE+/Mac ran the rest of the dBASE III+ program just fine. (It typically runs as much as 95% of standard FoxBASE+/PC and dBASE III+ code with no changes.)

And I built the reports I showed them from scratch. With no programming at all.

If you're looking for a better way to manage your data, call Fox Software and ask for their free demo. It limits the number of records you can store, but is the full program, so you can check it all out for yourself on your applications.

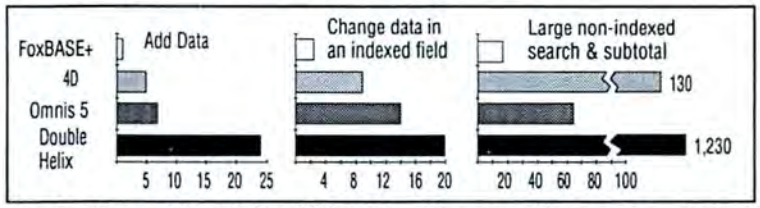
Around here, MIS has been pretty busy the last few weeks. They've hooked up Macs and PCs on an Ethernet network and our information and data processing systems are looking great.

They're building Hypercard-like applications I see people using all over the place.

Accounting likes all of this because the single-user version lists for $495, and the unlimited Multi-User version is only $695.

And even the PC programmers are happy. I hear them talking about things like the great trace and debugging facilities, adding XCMDs and XFCNs, the dBASE-like programming language, System 7 compatibility, full file and record locking in the multi-user version, and how FoxBASE+/Mac is "so astoundingly fast for a Mac."

Everyone seems to be laughing more now, too.



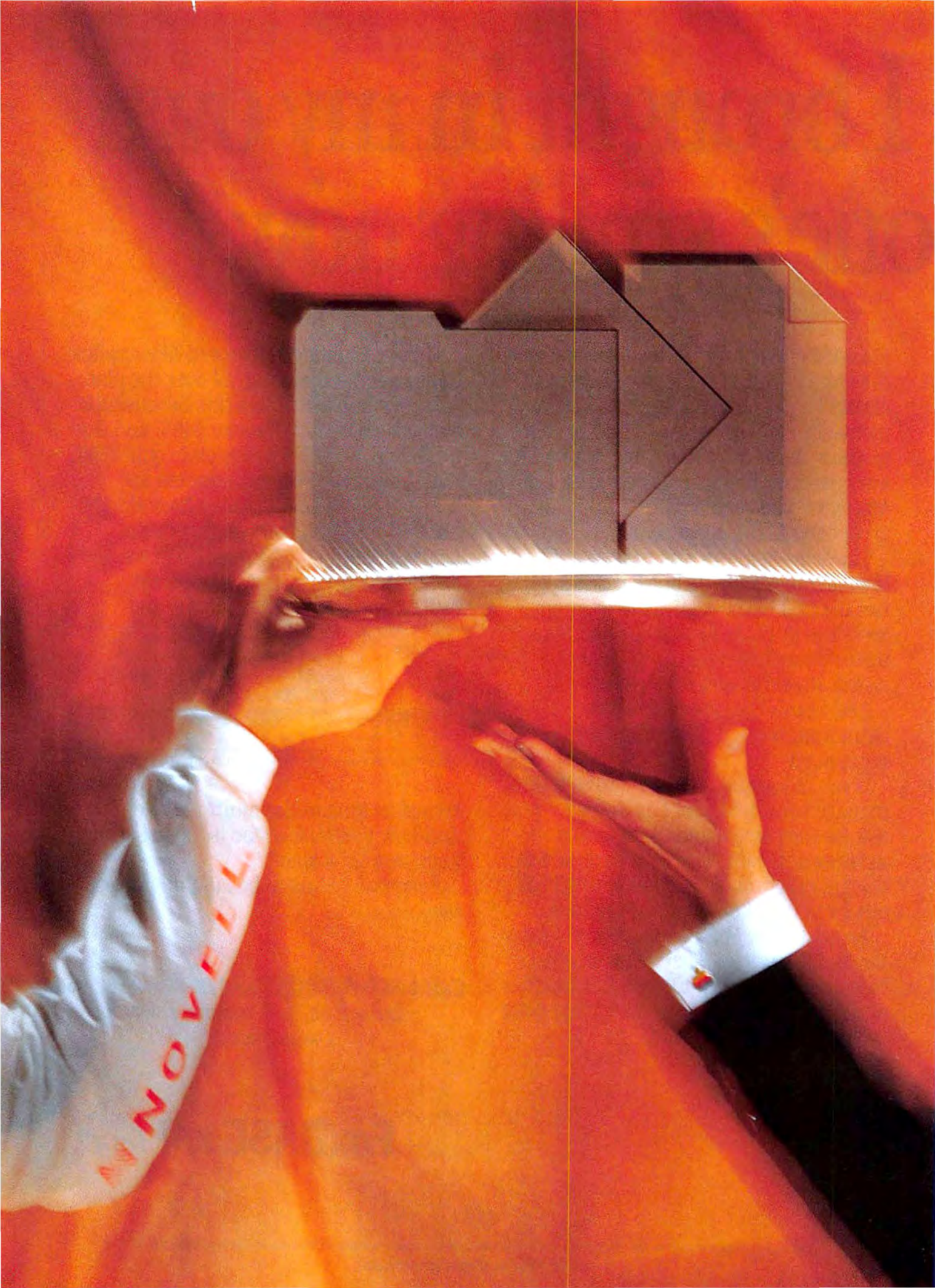
As MacUser said, with FoxBASE+/Mac "data handling is extremely fast."

Call 1-800-837-FOX2 or 419-874-0162 today for a free, full-featured demo.

(Ask for Offer MUS-1101)

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NOVELL

SUPER SERVER SOFTWARE: NetWare for Macintosh 3.0

Can Novell's NetWare steal top server honors from AppleShare? The new version for the Mac provides strong competition, but it's expensive.



BY KELLI WISETH
AND THE MACUSER LABS STAFF

AppleShare may no longer be the best file-server software for your Mac network. Although AppleShare is fast, easy to install and manage, and relatively affordable, it's being challenged by competitors that run on minicomputers, workstations, IBM PCs, and bargain-basement-priced PC clones.

In June '91, when MacUser Labs compared AppleShare with nine top cross-platform challengers (see "Mac, DOS, and VAX File Servers," page 134), we concluded that Apple's time-tested server software was still the price/performance leader. In the past few months, however, a challenger has emerged and AppleShare's dominance is no longer as secure.

PHOTOGRAPHY: WALT DENSON MODELS: THOMAS HUGHES, ROBERT BUEGER

This new contender — Novell NetWare for Macintosh 3.0 — is the latest effort from the established master of network software for the IBM PC. First released in 1983, Novell NetWare has become the most popular network operating system in the PC-compatible world. The NetWare product line comprises many products, each tuned to the needs of a particular segment of the networking community.

NetWare 2.2, released in the spring of 1991, is tailored to the needs of a small mixed workgroup — from 5 to 100 users of DOS- and OS/2-based machines. NetWare 3.11, also released this spring, is designed for high-performance, enterprisewide mixed networks — as many as 250 DOS computers, OS/2 machines, UNIX workstations, and mainframe computers. With the introduction of NetWare for Macintosh 3.0, as many as 100 Macs can be included in NetWare 3.11's high-performance mix.

NetWare 2.2 requires an 80286-based computer or later, whereas NetWare 3.11 runs on an 80386-based computer such as the Compaq DeskPro 386/33 or the Dell System 333D. With additional software — NetWare for Macintosh 2.2 with NetWare 2.2 and NetWare for Macintosh 3.0 with NetWare 3.11 — you can turn either of these Intel-CPU-equipped servers into a file server for Macs as well — you won't even know you're logged on to a PC.

But why would a Mac network manager consider switching to a non-Mac file server? Well, if you already have DOS- or OS/2-based computers in your organization, you can probably use existing equipment. If you want to combine Macs and PC-compatibles onto one network — especially if you want to share files among all platforms — this can be a cost-effective solution as well.

Switching to an 80x86-based server also lets you take advantage of the low-cost, high-performance bargains available in the PC-clone market. For example, a complete Zeos 33-megahertz 80386-based system with 1 megabyte of RAM, an 85-megabyte hard-disk drive, a monitor, a keyboard, and 24-hour toll-free technical support costs less than $2,500. You'd be hard-pressed to find a Mac with that much power at that price. Flip through the back pages of any PC magazine, and you'll find even lower prices.

When MacUser Labs tested NetWare for Macintosh 2.0 earlier this year for the June file-server report, we were impressed with its performance and features. However, we doubted that its high price would justify switching from AppleShare. Just as we were finishing that report, Novell released high-performance upgrades — NetWare 3.11 and NetWare for

Figure 1: Cost per User

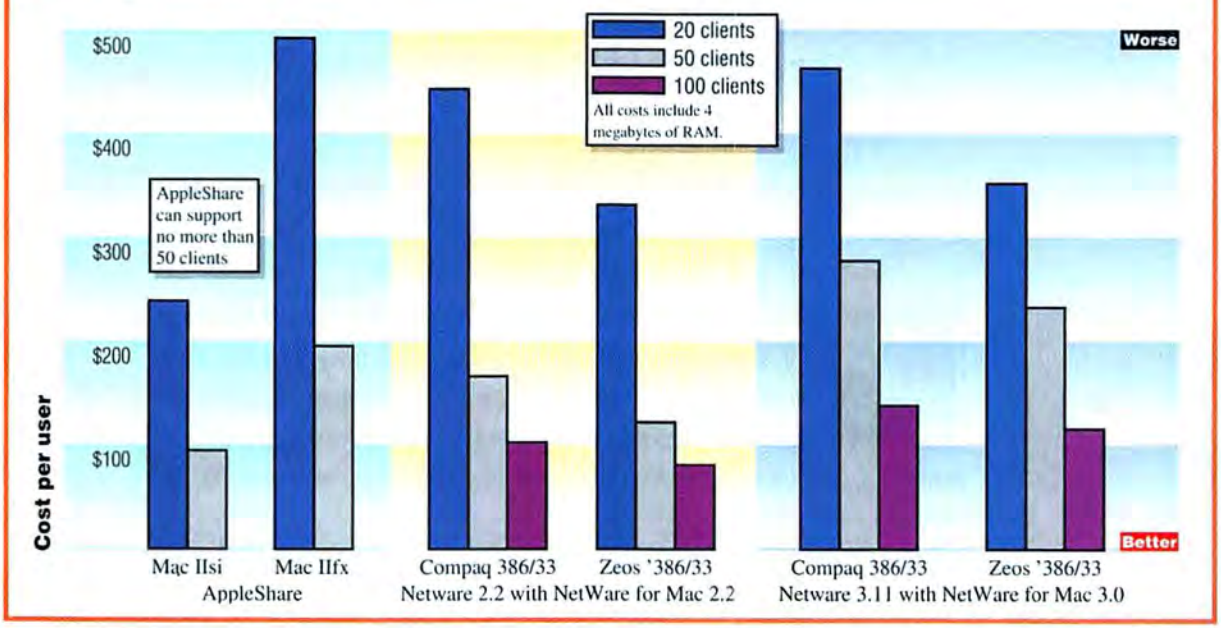


Figure 1: Novell NetWare becomes more cost-effective as your network grows. AppleShare can support only 50 users at a time, but both versions of Novell NetWare support as many as 100 Macintosh clients each. When run on inexpensive but powerful hardware, NetWare can be more affordable on a per-user basis than it first appears to be. Remember that you need a second 80x86-based machine to manage the server and, of course, a NetWare-knowledgeable person to administer it.

Macintosh 3.0 — to its top-of-the-line enterprisewide server software. However, price remains an obstacle: NetWare 3.11 commands a hefty $3,495 for 20 users, and NetWare for Macintosh 3.0 costs an additional $895. AppleShare remains a bargain at $799 for 50 users. NetWare 2.2 — an upgrade containing an amalgam of features from several of the NetWare 2 family of products and including NetWare for Macintosh 2.2 — is no impulse purchase either: It weighs in at $895 for 5 users.

To find out if these new competitors are worth their premium prices, MacUser Labs installed each NetWare system on a Compaq 386/33 and challenged AppleShare 2.0 running on a Mac IIsi and a Mac IIfx. And while we had everything set up, we also looked at the bottom rung of the server-software price ladder: the peer-to-peer file-sharing feature that's built in to Apple's System 7 (see the "You Get What You Pay For" sidebar).

Server Basics

A file server consists of three components: a computer, a hard-disk drive, and file-server software that lets network users access the hard disk. AppleShare is file-server software that runs on a Mac Plus or later Mac and works over an AppleTalk network through cables connected either to your Mac's LocalTalk port or to an EtherTalk card or SCSI device.

Apple designed AppleShare in conjunction with its system software, and the connection between a user's Mac (the *client*) and the AppleShare server is virtually seamless. This transparent communication between the AppleShare client and server is conducted according to AFP (AppleTalk Filing Protocol). AFP lets AppleShare control such things as file access by multiple clients — preventing two Microsoft Excel users from changing the same spreadsheet at the same time, for example.

AppleShare server software runs only on a Mac, but vendors such as Novell have added AFP compliance to their server software, enabling Mac clients to access a NetWare server as easily and transparently as if it were AppleShare on a Mac. Clients gain access to a NetWare server the same way as they do to an AppleShare server — simply by selecting its name from a list in the Chooser. However, NetWare stores files on-disk in its own unique format, which has been highly optimized for speedy access.

NetWare for Macintosh 2.2 is a

Figure 2: NetWare DA

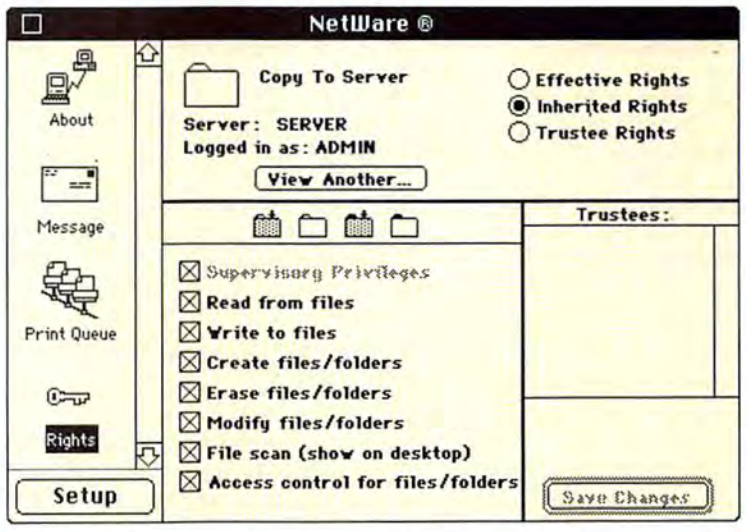


Figure 2a: The Rights dialog box displays your NetWare rights for a selected volume and folder. With NetWare for Macintosh 3.0, you can view rights to a selected file.

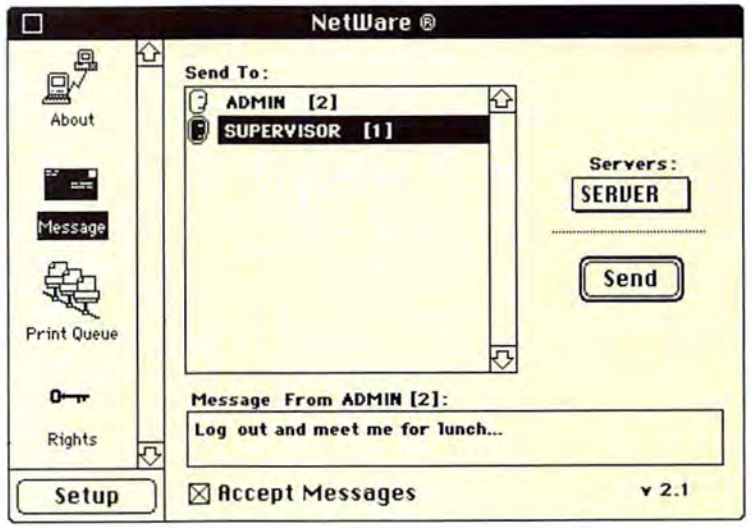


Figure 2b: The NetWare DA lets you swap messages with other logged-on NetWare clients, including PCs.

Figure 2: NetWare for Macintosh includes a DA that lets you send a message to another NetWare client, view print jobs in the NetWare print-server queue, see your security rights to a file or folder, and set NetWare rights to your own folders and files.

You Get What You Pay For

If you or others on your network have switched to System 7, you may not need to invest in server software — as long as your network needs are very basic. System 7's file-sharing feature (see Figure A) lets network users share folders and volumes without using a dedicated server. You can make as many as ten folders or disks available to other users.

You decide who can access the shared folders or disks and what their privileges are. Other users on your network — as many as ten at a time — access the shared folders or disks by selecting them in the Chooser. When shared resources appear on the desktop, they look just like AppleShare volumes. System 6 users can also access your shared files but can't share their files with others.

Unfortunately, when we ran our suite of benchmark tests, we found that old bromide "There's no such thing as a free lunch" to be true. AppleShare was twice as fast as System 7's free file-sharing feature on a IIsi. Although file sharing greatly opens up communications on a peer-to-peer basis, don't expect to squeeze file-server performance out of file sharing simply by dedicating a Mac to the task.



Figure A: System 7 supports simple file sharing, controlled by the Sharing Setup control-panel dialog box.

Novell *VAP* (Value Added Process) that runs on top of the NetWare 2.2 file-server software and translates between the NetWare file format and AFP. NetWare for Macintosh 3.0, which requires NetWare 3.11 and later, is an *NLM* (NetWare Loadable Module) — it's linked directly into the 32-bit multitasking NetWare operating system for enhanced performance. Each version of NetWare for Macintosh also comes with a NetWare DA for the client Mac that provides additional utilities for viewing access privileges and sending messages (see Figure 2).

Mac and PC users of a NetWare server can share files among machines. The Mac filenames look like standard DOS files named by a PC — they're limited to eight characters, a period, and a three-character extension. DOS files, on the other hand, attain Mac icons when viewed from the Mac (see Figure 3). Novell also sells software that lets you launch DOS applications from your Mac (see the "Mac As a Virtual PC" sidebar).

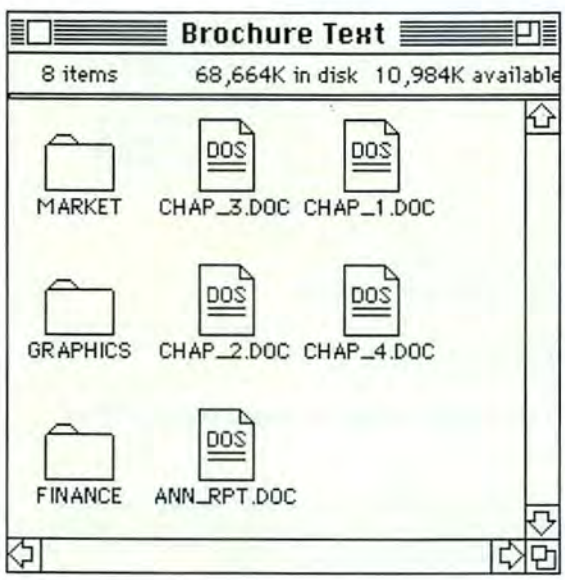


Figure 3: When you copy DOS files from the server to your Mac, the *DOS subdirectories* appear as folders; DOS files and applications display the word *DOS* in their file icons. If a Mac application — WordPerfect, for example — is designed to read the format of a particular DOS file, you can open that DOS file from within the Mac application.

Laborious Installation

Installing AppleShare is a simple matter of dragging the software to the hard disk, followed by a click here and a double-click there, but installing NetWare — either 2.2 or 3.11 — requires that you know your way around the C: prompt, hard-disk-drive-partition tables, and hexadecimal network numbers, among other things. Although installing NetWare 2.2 is much easier than installing previous versions, you should still hire a certified NetWare consultant to help with its installation.

Installing NetWare 3.11 is also a job for a pro. As with 2.2, the first time you set up the hardware, you may also have to configure network-interface cards and perform low-level hard-disk formatting — a far cry from pulling a Mac IIsi out of a box and cabling up. If you're not a die-hard do-it-yourselfer, consider buying a "NetWare ready" hard-disk drive from a vendor such as Seagate — the NetWare server software is already installed, and you just have to install the NetWare for Macintosh module, which by itself is not too daunting a task.

For those of you who insist on going it alone, Novell's documentation is well organized and coherently written and includes a book of basic concepts that does a good job of fleshing out the

nitty-gritty details. And you don't have to read each and every one of the dozen or so volumes to get started or to troubleshoot your system.

Fast and Fail-Safe

At first glance, the difference in price between AppleShare and either of the NetWare products seems staggering. But when you start sifting through the feature sets, you realize that AppleShare is strictly a file server, providing service for as many as 50 clients, but that NetWare includes such features as print services, a software router for connecting dissimilar networks, and a host of additional security features not available on a stock Mac-based AppleShare server.

And when it comes to networking and file service, reliability is every bit as important as speed. *System fault tolerance,* a feature of NetWare 2.2 and 3.11, protects server data through various multiple-hard-disk schemes. One form of system fault tolerance is *disk mirroring* — automatic duplication of a hard disk's data onto a second hard disk through the same hard-disk controller card and data channel. You do need a second hard disk for this, but both hard disks share the same controller. *Disk duplexing,* another form of system fault tolerance, is similar to mirroring but provides greater protection at a faster speed, because the duplication takes place through a second channel — you need a second hard disk and a second controller card. (Remember, however, that using NetWare is not the only way to gain the peace of mind that duplexing provides: The Golden Triangle DiskTwin 2.0 [$999] is a disk-duplexing system that can add a similar level of protection to a Mac-based server.)

Two of NetWare's features, *read-after-write-verification* and *Hot Fix,* ensure that data won't be written to unreliable blocks on the hard disk. Data written to the hard disk is read back from the hard disk and compared with the original data still in memory. If the data doesn't match, Hot Fix redirects the original block from memory to the *Hot Fix Redirection Area* — a small portion of the disk's storage space that is automatically created during the installation process — for safe storage, and the location of the bad block is noted by the operating system to prevent subsequent writes to that block.

NetWare provides monitoring of a Novell-approved UPS (uninterruptible power supply) attached to the file server to provide backup power in the event of a power failure. If the power does fail, NetWare notifies any logged-on users and — after a period of time you can specify in a configuration file — logs out any remaining users, closes

The Mac As a Virtual PC

Novell NetWare for Macintosh extends your Mac's reach into the DOS world by letting it share files with IBM PCs on a single server. But sometimes you need to massage DOS files before bringing them onto your Mac for fine-tuning. For example, you might want to export selected fields from a dBASE III+ file as a tab-delimited file for importing into Microsoft Word on your Mac. Because you can't launch dBASE III+ on your Mac, you need access to a DOS machine to tweak that database file. Don't have a DOS machine on your desk? Don't worry — with Novell's NetWare Access Server, you can use your Mac instead.

Access Server runs on a dedicated 386 machine and enables remote users to dial in to a NetWare network and access anything available on that network — data, applications, E-mail, mainframes, and minicomputers.

Novell recently released Version 1.2 of the Access Server software ($2,395), which now includes *application-server* features — applications are downloaded from the network file server and processed at the machine running Access Server rather than at the remote workstation. In true multitasking fashion, Access Server can run as many as 16 such sessions concurrently.

OnLAN/Mac, part of the Access Server upgrade, is emulation software that runs on your Mac and lets you connect to the machine running Access Server for DOS sessions. Simply launch the OnLAN/Mac application and log on to the Access Server machine, and the DOS interface appears as a window on your Mac monitor (see Figure B). You can switch between Mac and DOS applications simply by selecting a window, as you normally do under MultiFinder. You can also run multiple DOS sessions concurrently — up to the 16-session constraint imposed by Access Server.

Even if you don't need — or want — to run DOS applications on your Mac, NetWare Access Server lends a great deal of flexibility when Macs are part of the network. For example, network administrators can log on to the Access Server machine from their Macs and then log on to the file server and perform network maintenance from their Macs — a task previously limited to PC users.



Figure B: By logging on to Access Server, you can launch a DOS application — such as Microsoft Word 5.0 — and cut and paste directly into a Mac Word 4.0 document. And you can launch another DOS session to control the NetWare server directly from your Mac.

any open files, and shuts itself down.

Finally, another powerful security feature included in both NetWare versions we tested is a transaction-tracking system, which protects multiuser application files from corruption because of incomplete transactions — during a system crash or hardware failure, for example. If there's a network failure, the transaction-tracking system *backs out* incomplete transactions — the data and index information in the database are returned to the state they were in before the transaction began.

NetWare for Macintosh 3.0 also includes the AppleTalk console utility — ATCON — an NLM for use at the file-server console for monitoring AppleTalk networks. With ATCON, you are able to verify that another AppleTalk node is communicating on

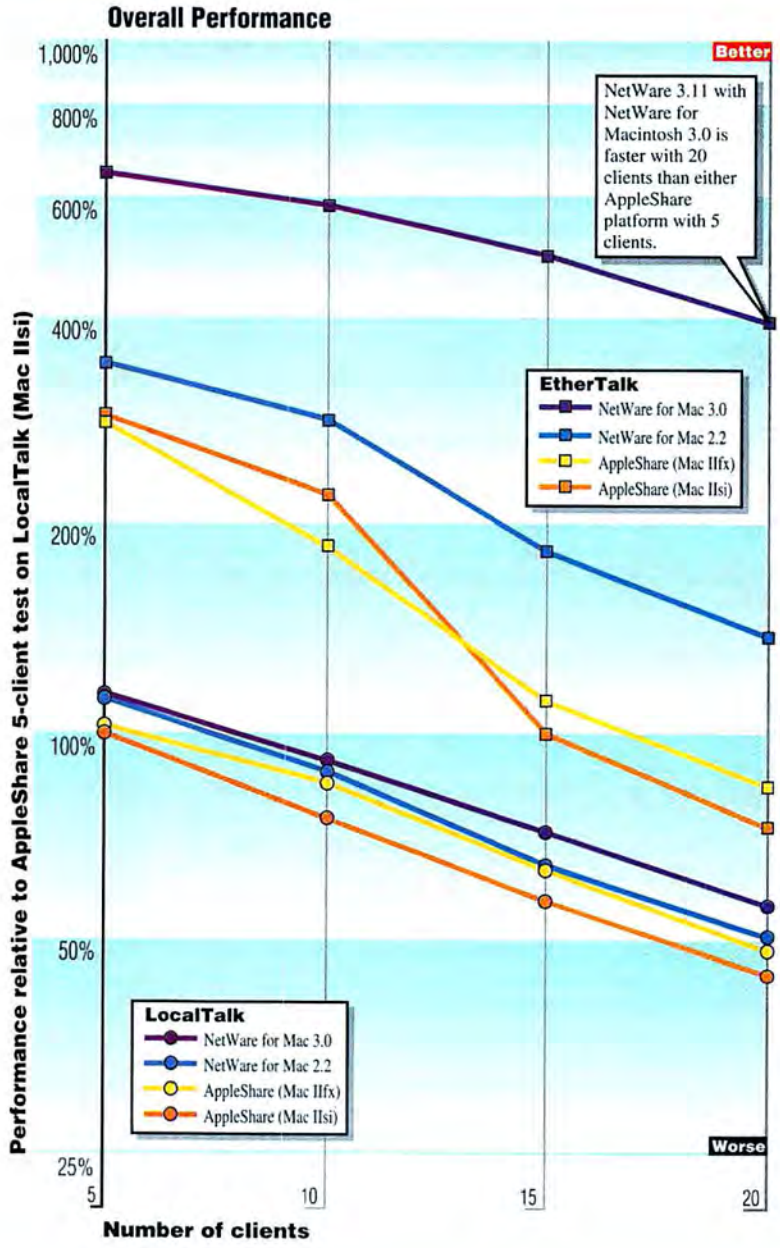
Figure 4: File-Server Performance

Figure 4: To test file-server performance, we performed a suite of tests that included file reading and writing and database searching while busying the server with requests from 5, 10, 15, and then 20 Macs. Our Mac server platforms consisted of a Mac IIfx and a Mac IIsi, each with 5 megabytes of RAM. For the two Novell servers, we used Compaq DeskPro 386/33s with 7 megabytes of RAM apiece. We conducted all tests over EtherTalk as well as LocalTalk. We plotted all results on a logarithmic scale to emphasize differences among servers on LocalTalk.

Overall Performance:
We compared the results of all tests with those from AppleShare on a Mac IIsi running on an EtherTalk network. NetWare 3.11 with NetWare for Macintosh 3.0 gave breathtaking performance, particularly at the 15- and 20-client marks.

File-Transfer Speed:
We kept the file server active with requests from 5, 10, 15, and 20 clients while a single client copied a 1-megabyte folder to the server. NetWare 3.11 with NetWare for Macintosh 3.0 at the 20-client load performed about as fast as NetWare 2.2 with NetWare for Macintosh 2.2 and AppleShare on a Mac IIfx with a 5-client load. We also read the same file *from* the server, with similar results.

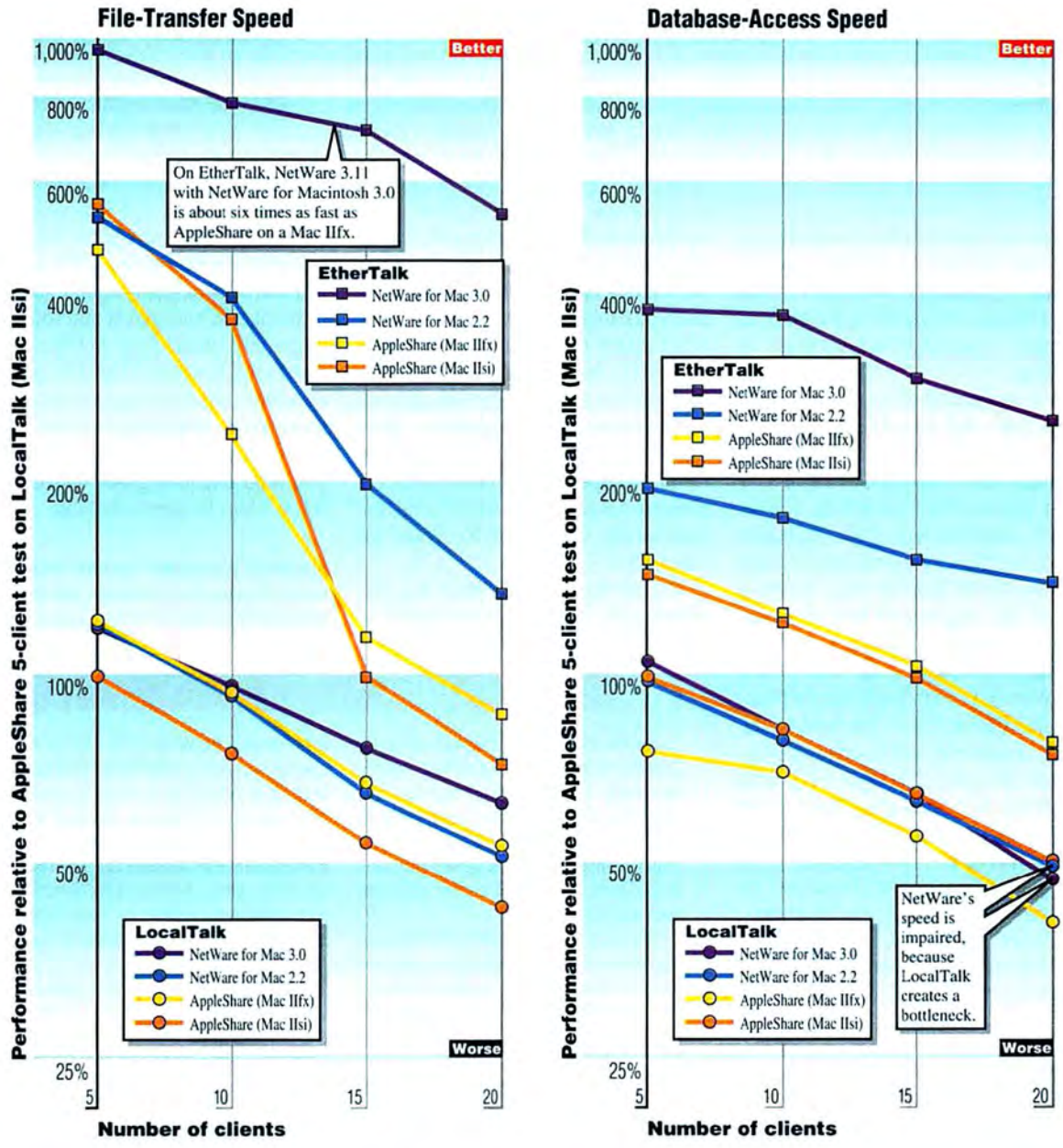
Database-Access Speed:
While one client searched for, changed, and summarized data in a 4th Dimension database on the server, the other clients — 5, 10, 15, and 20 at a time — searched the 6,000-record database at random. Again, NetWare 3.11 with NetWare for Macintosh 3.0 finished first, and at 20 users, it was more than three times as fast as AppleShare on a Mac IIfx.



the network and view router statistics, for example, to help troubleshoot network problems.

Snappy Service

We got a hint of NetWare's capabilities during testing for our June report and were anxious to find out just what the high-end NetWare 3.11 with NetWare for Macintosh 3.0 could do. We installed NetWare on a Compaq 386/33 with 7 megabytes of RAM and a 310-megabyte hard-disk drive, connected 21 Macs, and ran our full suite of file-server tests. Keeping each file server busy with requests from 5, 10, 15, and 20 Macs, we timed file transfers between the 21st Mac and the server. Our database-access tests likewise placed increasing and varying demands on the server: While one



On the Horizon

When it comes to file servers, there's always room for improvement. With that in mind, Novell began its NetWare UpDate for NetWare for Macintosh program in late August. For $225 or $500 per year — for 20-user or 100-user plans — NetWare UpDate subscribers will receive all updates, patches, fixes, and enhancements released for their particular NetWare product. Novell intends to distribute maintenance releases and enhancements quarterly, to NetWare UpDate subscribers only. The company is offering six months of the UpDate program free to purchasers of NetWare for Macintosh 3.0.

Novell's first UpDate, which also shipped in late August, adds support for Macs on ARCnet networks and enables LaserWriters to be directly attached to the NetWare server through the serial or parallel port rather than through the LocalTalk port. The UpDate also supports *seed routing* — NetWare for Macintosh 3.0's internal AppleTalk router now has the ability to automatically learn the network configuration from other AppleTalk routers on the network.

One of NetWare's major attractions in the PC world has been its superfast database access, and that same level of performance will soon be available to users of NetWare for Macintosh.

In March 1991, Apple licensed to Novell its DAL (Data Access Language) API, or *application-programming interface*, which simplifies the communication between Mac applications and information stored in databases on other computers. NetWare for Macintosh users will soon be able to access the network database services of NetWare SQL, Novell's high-performance relational-database engine designed specifically for the NetWare operating system. The DAL interface to NetWare SQL will let Mac users tap into vast storehouses of data already available in the thousands of databases on NetWare file servers. Because it's a server-based application built on NetWare, NetWare SQL can be managed in the same way as any other component of the NetWare network, using NetWare backup, administrative procedures, and security features.

Macintosh searched for, changed, and summarized data in a 6,000-record 4th Dimension database on a server, the other Macs — 5, 10, 15, and then 20 at a time — searched the database at random.

We conducted all tests over both EtherTalk and LocalTalk networks and found that there's really no reason to install NetWare — either 2.2 or 3.11 — if you're using LocalTalk. LocalTalk's slowness hampers a high-performance file server considerably (see Figure 4). If you're still running LocalTalk, upgrade to EtherTalk before you invest in NetWare.

When we began testing, we expected NetWare 3.11 with NetWare for Macintosh 3.0 to be fast — but frankly, the results made even our jaded jaws drop. In test after test, NetWare 3.11 with NetWare for Macintosh 3.0 — on EtherTalk — left the others in the dust. And NetWare's performance edge really stood out as the client load on the server increased: At 20 clients, NetWare 3.11 with NetWare for Macintosh 3.0 was more than three times faster than AppleShare on a Mac IIfx.

Serves You Right

File servers enhance workgroup productivity, but they have to be fast to be effective — and none is faster than NetWare 3.11 coupled with NetWare for Macintosh 3.0. Using a PC-based file server provides the advantage of file sharing between PCs and Macs — and you can use an 80386-based computer that is far less expensive than a Mac IIfx. In fact, you may already have the server hardware and software you need in another department serving files on an existing Novell network — and 60 percent of networked PC sites do. All you need to do is install the appropriate version of NetWare for Macintosh.

But switching to NetWare has disadvantages. You need a second PC to administer the PC server, and you need to know your way around DOS and the NetWare operating system. If top performance isn't necessary and you don't frequently share files between PCs and Macs, keeping Mac file services on a Mac file server may still make the most sense. And keep in mind that if you stick with AppleShare on a Mac, you'll be able to upgrade with ease as faster Macs become available.

Kelli Wiseth is a *MacUser* associate editor. As a former PC-applications developer, she fondly remembers the romance of the C:\> prompt.

The Bottom Line

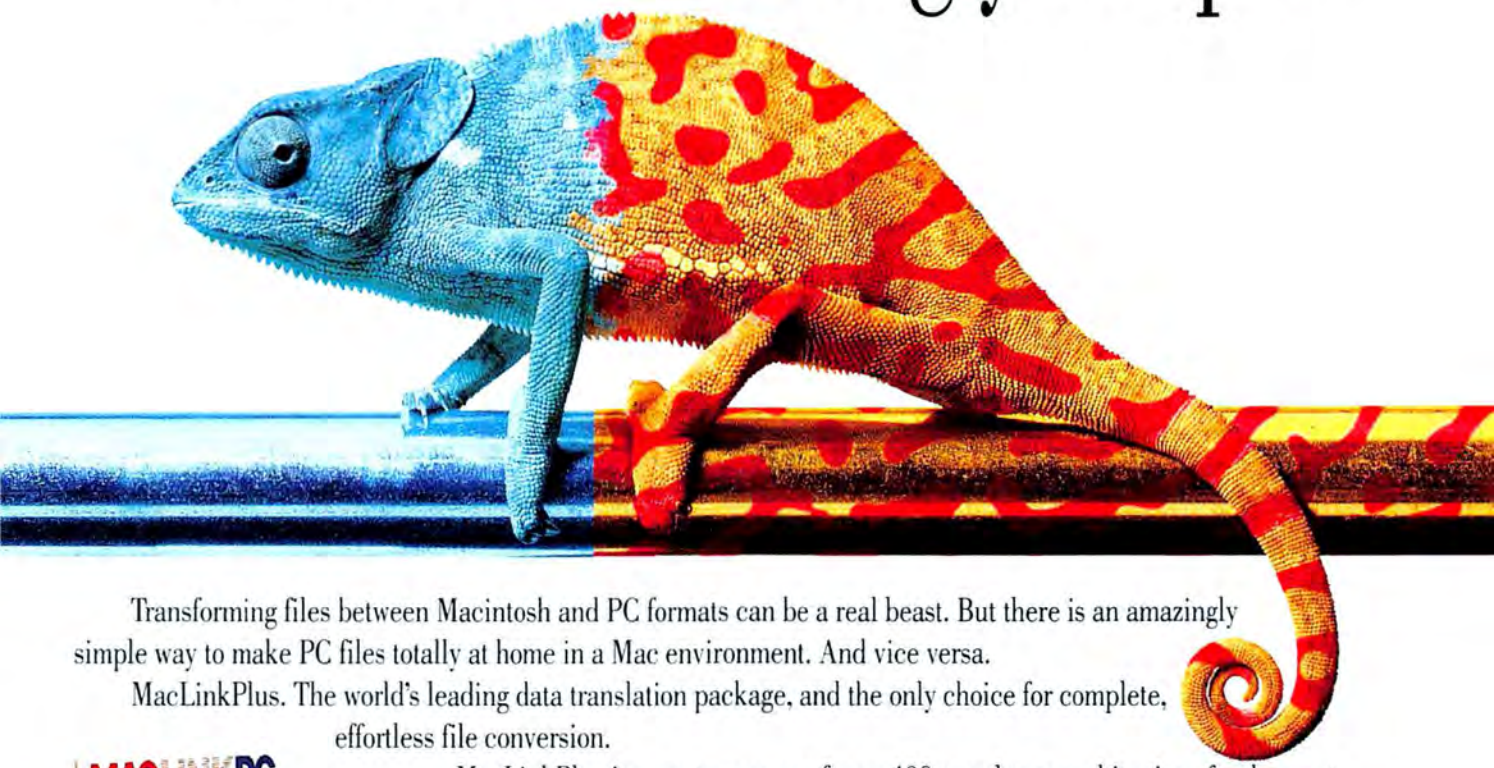
No Mac is an island. Thanks to its built-in networking system — LocalTalk — Macs can easily link with other machines and store files on a central file server. But such simple networking and file serving has a negative side — Apple's server software, AppleShare, bogs down dramatically with each additional client.

But you're no longer limited to choosing AppleShare on a Mac: AppleShare-compliant server software runs on a variety of hardware platforms, including PCs based on the Intel 80x86 family that can be purchased for far less than a high-performance Mac.

For those who want the fastest file server around and also need to share files among Mac, DOS-based, and OS/2-based clients and even UNIX-based minicomputers and mainframes, **NetWare 3.11** ($3,495/20 clients) with **Novell NetWare for Macintosh 3.0** ($895/20 clients) provides breathtaking performance. NetWare also provides a panoply of high-end network-management features such as system fault tolerance, with support for disk mirroring and duplexing; server- or client-based backup; and an AppleTalk-network monitoring system.

If your network is small and composed solely of Macs, you may find that NetWare has far more power than you need. But the larger your network and the more PCs and Macs you have that need to share files and services, the sooner NetWare 3.11 with NetWare for Macintosh 3.0 will justify its high initial cost.

With MacLinkPlus, Transforming Files Between Macs And PCs Is Amazingly Simple.



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CIRCLE 163 ON READER SERVICE CARD.

Table 1: Features of File-Server Software







● = yes ○ = no	Apple AppleShare 2.0 $$$½	Novell NetWare for Macintosh 2.2 with NetWare 2.2 $$$	Novell NetWare for Macintosh 3.0 with NetWare 3.11 $$$$½
Price/clients supported	$799/50	$895/5, $1,995/10, $3,495/50, $5,495/100	NetWare for Macintosh 3.0, $895/20, $1,995/100; NetWare 3.11, $3,495/20, $6,995/100
Pros	Easiest to install and maintain. Inexpensive.	Fast. Extensive data-security features.	Very fast. Extensive data-security features.
Cons	File-server features only. Additional capability must be purchased separately.	Must administer from a second 80x86 machine.	Must administer from a second 80x86 machine. Expensive for small network.
Features			
Hardware required	Mac Plus or later	80286-based PC	80386- or 80486-based PC
Maximum no. of clients	50	100	250*
Set up from Mac	●	○	○
Administer from Mac	●	limited	limited
AppleShare-client software	●	●	●
Additional clients supported	ProDOS, DOS	DOS, OS/2, Windows	DOS, OS/2, Windows, UNIX
Print services	○	●	●
AppleTalk router services	○	○	●
Server-based backup	○	●	●
Client-based backup	○	○	○
Network monitoring	○	○	●
Company	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010	Novell, Inc. 122 E. 1700 S. Provo, UT 84606 (800) 453-1267 (801) 429-7000	Novell, Inc. 122 E. 1700 S. Provo, UT 84606 (800) 453-1267 (801) 429-7000

*Of these, only 100 can be Macs.

Table 1 Criteria

Price/clients supported — The price of the software and the number of clients it supports. Server software is typically priced according to the number of users.

Hardware required — The type of computer on which the server software runs.

Maximum no. of clients — The number of simultaneously logged-on Mac clients the software supports.

Set up from Mac — Can you install the server software from a Mac?

Administer from Mac — Can you administer the server from a Mac?

AppleShare-client software — Can users access the server from their Mac with standard AppleShare-client software, which is included with Systems 6 and 7?

Additional clients supported — Other clients with which your Mac can share data.

Print services — Does the server software include print server software for spooling print jobs to AppleTalk printers?

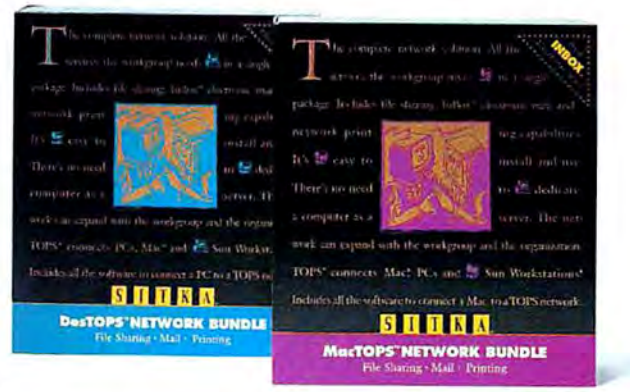
AppleTalk router services — Does the software provide routing services?

Server-based backup — Does the package include software for backing up the file server?

Client-based backup — Does the package include software for backing up client workstations?

Network monitoring — Does the package include a network-monitoring utility for troubleshooting the network?

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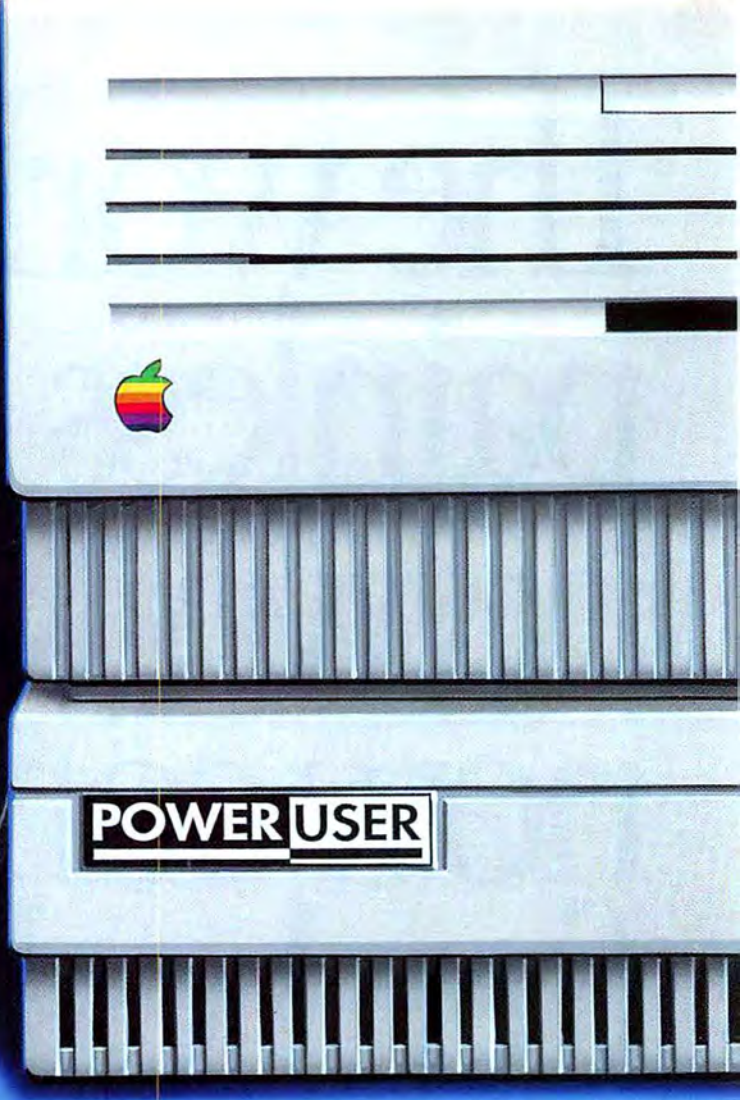
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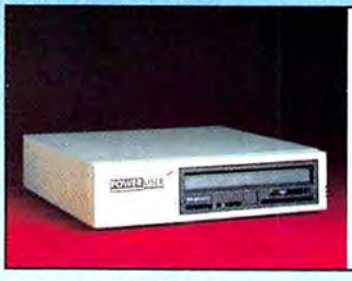
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DRI 0206

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2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount of memory.	**Do this: (Install in multiples of four only.)**
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
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❼ Also, TelePortFAX includes SendFAX 9600 baud modem software. Hold OPTION as you drag FILE-PRINT to easily send Faxes worldwide. **MOD0058 $185.**

Carbon Copy Mac 2.0 Single & Unlimited (Microcom) ❼ Allows you to operate another Mac from your own Mac. You can control the remote Mac's screen, keyboard, mouse, and exchange files. Great for remote access, file sharing, project collaboration, and training. Carbon Copy for the Mac offers password protection, and includes the Virex utility to ensure virus-free file transfer. Available in single or unlimited user. **Single: NET0131 $59. Unlimited: NET0132 $179.**



System 7 Compatibility: ❼ indicates that the product will run under System 7.

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Toner Cartridge
LaserWriter II 105

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ACC0356 Dust Cover - Mac II & Extended Keyboard (grey nylon) 17
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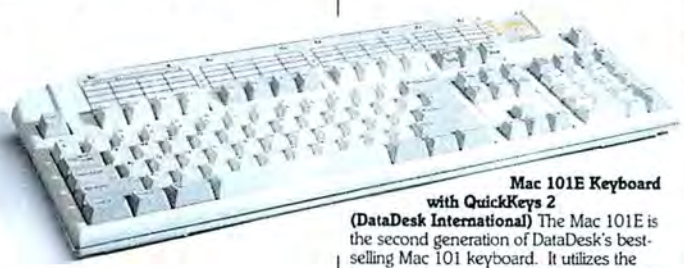
Curtis
ACC0469 Command Center 89

Ergotron
ACC0344 MacTilt II - 13" Color RGB 75
ACC0128 MacTilt Plus/512 - Platinum 68
ACC0009 MacTilt SE, SE/030 - Platinum 68

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DAC0038 DigiMatic 179

I/O Design, Inc.
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ACC0327 Monitorware Apple RGB Case 79
ACC0427 Ultimate Classic/SE Ext. Carrying Case - Black 85
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Mac 101E Keyboard with QuickKeys 2 (DataDesk International) The Mac 101E is the second generation of DataDesk's best-selling Mac 101 keyboard. It utilizes the industry-standard 105-key layout, including 15 function keys, 6 separate screen control keys with inverted-T cursor keys, and isolated Esc and Reset keys. It incorporates many advanced features, including a built-in template system (one template included), a Comma/Period lock, interchangeable Caps Lock and Control key, and more. Even more important, the Mac 101E gives you the "touch and feel" that lets you type faster, with fewer mistakes. It works with all models of the Mac, and comes with manufacturer's three-year warranty. **INP0183 $149.**

Mobius Products
ACC0055 Fanny Mac QT 55
ACC0247 SE Silencer 39

OCLI
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ACC0586 Glare/Guard Plus Portrait 85

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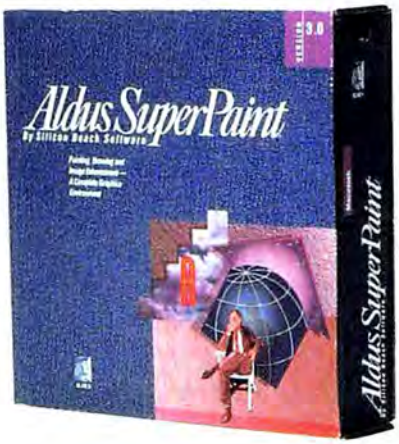
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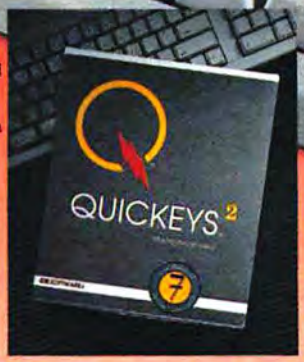
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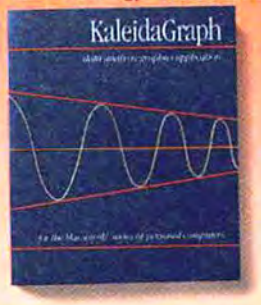
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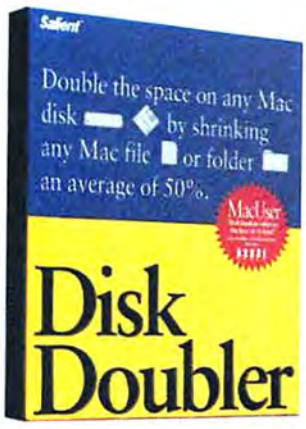
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DiskDoubler 3.7 (Salient Software)
❶ DiskDoubler 3.7, the system 7 savvy version, compresses your files when you save them and expands them when you open them. It doubles your hard disk and floppy disk storage capacity. Works transparently within any application, and operates in the background under MultiFinder. DiskDoubler works with documents, applications, plus sound graphics, and scanner files. **UTI0179 $49.**

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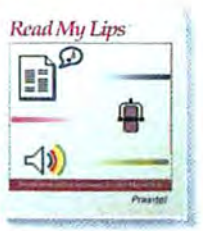
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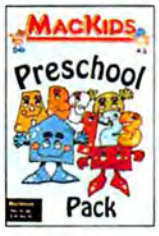
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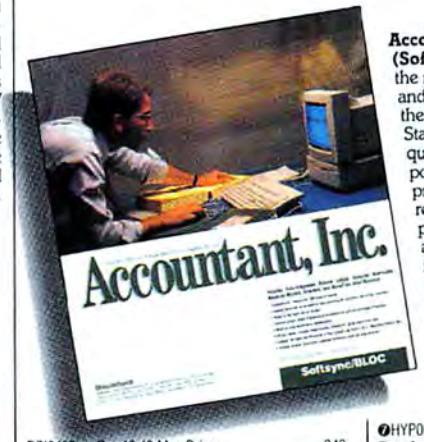
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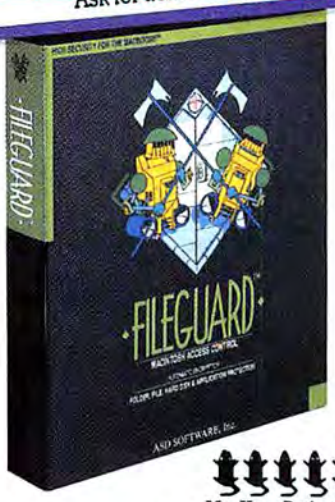
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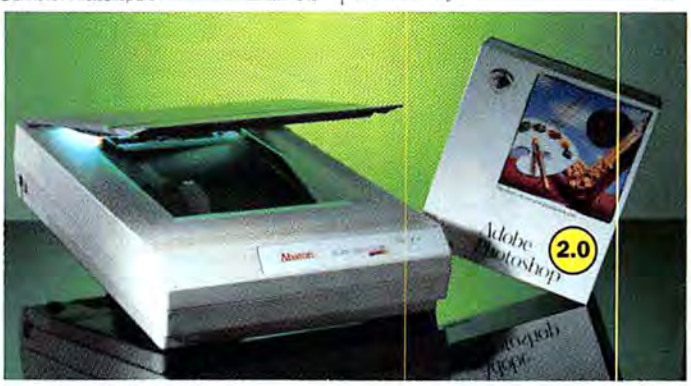
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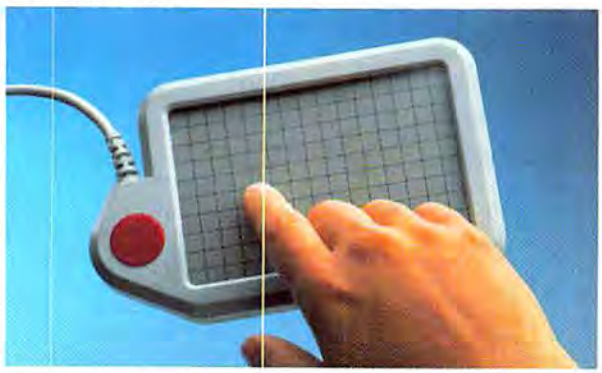
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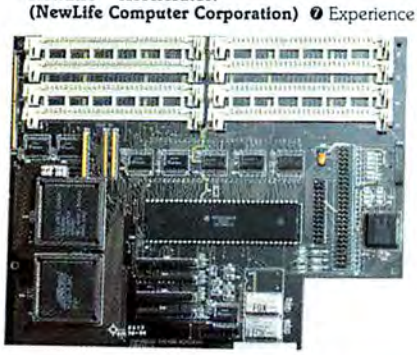
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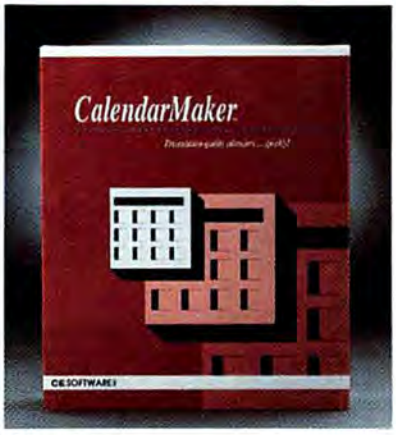


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Mac Trac Pro
(Keytronic) ❶ Features a 101-key layout similar to an Apple Extended keyboard, with the convenience of an integrated trackball. Includes 7 user-definable buttons with Control Panel software, interchangeable Caps Lock and Ctrl keys, Period/Comma lock, adjustable key feel and FREE offer for Tempo II. **INP0192 $219.**

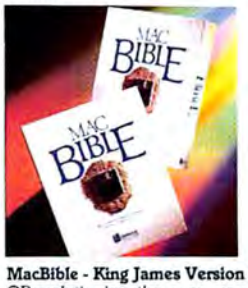
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❶ Compatible with all Macintosh computers, the enhanced 105-key layout includes Period/Comma lock capability. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited-lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems a $149.95 value FREE! **INP0156 $145.**



CalendarMaker
(CE Software) ❶ CalendarMaker generates presentation quality calendars for use in offices, homes, churches, organizations, schools, newspapers or any place you need a calendar. You can preview individual days in the edit window or show a full page preview. Periodic events, such as weekly club meetings, are easily displayed. CalendarMaker prints to the ImageWriter, Laser Printer and to the disk in Text, Paint, or PICT file formats. Full color printouts are possible when using the ImageWriter II. **GRA0070 $31.**



White Knight V.11
❶The perfect low-cost solution to almost any Mac User's telecommunication needs. Offers the kind of power associated with products costing hundreds of dollars more. Winner of 11 awards including MacWorld's World Class Software Award. **COM0060 $85.**



MacBible - King James Version
❶Revolutionize the way you study the Scriptures. Includes a flexible word-and-phrase search mode, a verse mode for displaying any range of verses, and a count mode for showing statistical information about words. **BOK0021 $79.**



Inspiration 3.0
Unleashes the creative potential of your mind. Start by sketching on screen with blocks and soon, you will see the connections, and start to fill in the gaps. Or make a verbal outline to get the creative juices flowing. Converts either view into the other one to help you finish the project. When you're ready it creates presentation graphics, outlines and reports. **EDU0271 $169.**

Strategic Mapping, Inc.
GRA0227 Atlas MapMaker 4.5 459.
SuperMac
❶GRA0253 PixelPaint 2.1 159.
❶GRA0249 PixelPaint Professional 2.0 499.
T/Maker Co.
GRA0039 ClickArt Business Image 32.
GRA0272 ClickArt Color Graphics for Presentations 99.
GRA0088 ClickArt EPS Illustrations 82.
GRA0270 ClickArt-Events and Holidays 32.
Virtus
GRA0278 Virtus WalkThrough 259.
Zedcor
❶GRA0199 DeskPaint & DeskDraw 3.03 113.

INP0183 Mac 101E Keyboard w/Quickeys 2 149.
Digital Vision, Inc.
GRA0145 Computer Eyes B & W 199.
❶GRA0154 Computer Eyes For Mac-Color 349.
ICD
INP0095 Graflex 82.
Kensington
INP0060 Turbo Mouse ADB (SE or II) 109.
Key Tronic
❶INP0156 Mac Pro Plus 145.
❶INP0192 Mac Trak Pro 219.
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❶INP0143 Typist 1.1 479.
CoStar
❶INP0091 LabelWriter 185.
Epson
INP0167 Epson EPL-7500 Laser Printer 2599.
INP0173 Epson PostScript Kit 1599.
Seikosha
INP0041 Seikosha SP 2000 AP Printer 235.
Sharp
COMP007 Wizard OZ 7000 (32KRam) 229.
COMP018 Wizard OZ 7200 (64KRam) 255.
COMP019 Wizard Oz 8000 (64KRam) 329.
COMP023 Wizard Oz 8200 (128KRam) 399.
ThunderWare
INP0116 LightningScan 400 385.
INP0189 LightningScan Pro 256 539.
❶INP0007 ThunderScan Plus 199.

INPUT & OUTPUT

Abaton
❶INP0157 Scan 300/Color 1499.
INP0164 LaserScript Printer LX 1729.
Articulate Systems
❶INP0160 Voice Navigator II 559.
CH Products
INP0121 RollerMouse ADB 75.
Datadesk International
INP0174 Mac101E Keyboard 129.

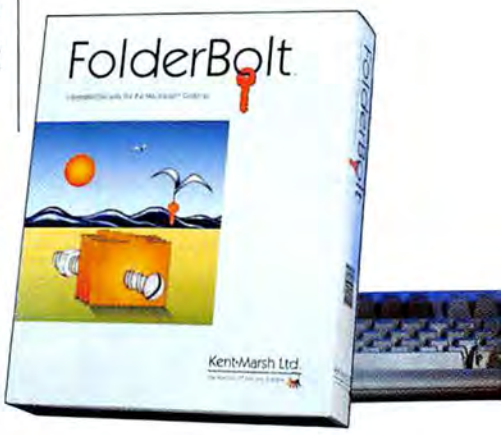
Microspeed
INP0126 MacTRAC ADB 75.
INP0140 MacTRAC DB9 62.
Microtek
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❶INP0176 ScanMaker 1650S 2369.
❶INP0162 TrueLaser Printer 2019.
MicroTouch
❶INP0084 The UnMouse 159.
Mouse Systems
❶INP0132 Little Mouse ADB 74.
❶INP0134 Trackball / ADB 69.

FolderBolt
(Kent Marsh) "If you work in a shared environment, but don't want to share everything on your Macintosh, you may want a copy of Folder Bolt...FolderBolt is a welcome addition to the Security Arsenal." MacWeek June 25, 1991. Create completely locked folders, read-only folders, or password protected drop box folders. No one without the password can open, duplicate, delete, or move them. FolderBolt can unlock all your folders at once and re-lock them on shutdown. Also generates a complete audit trail of all activities. **UTI0212 $79.**

Sophisticated Circuits
ACC0535 Power Key w/Quickeys Lite 64.
ACC0619 Power Key Remote 35.
Wacom
INP0151 Digitizing Tablet 12" x 12" 845.
INP0177 Digitizing Tablet 12" x 12"-Electrostatic 929.
INP0179 Dizitizing Tablet 6" x 9" 589.

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Connectix
❶DRI0385 MC73 159.
❶UTI0222 MODE32 99.
UTI0144 Virtual 030 2.0 UM3 113.
DRI0185 Virtual 2.0 PMMU 188.
DayStar Digital
❶DRI0224 64K FastCache IIci 279.
❶DRI0288 40 MHz PowerCache (IIci) 959.
❶DRI0290 50 MHz PowerCache (IIci) 1699.
❶DRI0416 RAM PowerCard 749.
Dove
❶DRI0130 MaraThon 030 (MacII) 599.
❶DRI0198 MaraThon 030 - (Mac SE) 399.
❶DRI0197 MaraThon 030 - (Mac Plus) 399.
❶DRI0152 MaraThon 030X (MacIIx) 599.
❶DRI0151 MaraThon 030-SE/030 599.
❶DRI0380 Marathon Racer For Mac II 1079.
❶DRI0378 Marathon Racer For Mac Plus 599.
❶DRI0379 Marathon Racer For Mac SE 599.
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CHP0026 Mac Classic 3 Meg Upgrade 179.
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❼CHP0013 1 Meg Simm 100ns PowerUser 59.
Total Systems
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❼DRI0302 Gemini 25 MHZ Card 1135.
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❼DRI0362 Gemini Classic 25MHz 68030 1229.
❼DRI0364 Gemini CLassic 33MHz 68030 1499.
❼DRI0265 Gemini Plus Kit 129.
❼DRI0295 Mercury 16MHz 68030 - Plus 499.
❼DRI0297 Mercury 16MHz 68030 - SE 365.
❼DRI0299 Mercury SCSI Module - Plus 209.

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MOD0034 InterFax 24/96 339.
Applied Engineering
❼MOD0054 DataLink/Mac 209.
Best Data
MOD0021 SmartOne 2400/1200 139.
Dove
❼MOD0038 DoveFax Desktop 299.
❼MOD0053 Dove Fax Plus 359.
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❼MOD0049 TelePort 2400 ADB Modem 139.
❼MOD0058 TelePort/Fax 9600 185.
Hayes
COM0023 Smartmodem 2400 349.
MOD0017 Smartmodem 9600 (V series) 589.
MOD0060 Personal Modem 2400 w/Smartcom 149.
MOD0065 Bundle V-Series Ultra SmartModem 9600 829.
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❼MOD0064 ProModem Ultima 699.
❼MOD0035 TravelModem 199.
Shiva
❼NET0067 NetModem V.32 (9600) 1169.
Supra Corporation
❼MOD0020 SupraModem 2400 119.

Meeting Maker
(ON Technology, Inc.) A Macintosh network application that helps you plan, schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. You can also print your calendar in popular day-planner formats. **BUS0165 $309.**



Electronic Arts
MUS0004 Deluxe Music Construction 2.5 85.
Farallon™ Computing
MUS0036 MacRecorder® 2.0 174.
Opcode Systems
MUS0083 MIDI Translator 43.
Repertoire
MUS0034 Music Publisher 2.5 359.

SECURITY & VIRUS PROTECTION

ASD Software, Inc.
❼UTI0135 FileGuard 2.7 139.
❼UTI0130 FileGuard 2.7 - Office Pack 5 499.
❼UTI0131 FileGuard 2.7 - Office Pack 10 799.
❼ACC0539 MaccessCard Reader 299.

Retrospect 1.3 & Retrospect Remote (Dantz Development)
❼ Schedule automatic, unattended backup to any tape, optical or cartridge drive with Retrospect's calendar launch features. Liberate valuable hard disk space by archiving inactive files until needed. For the network manager, Retrospect Remote backs up an entire network of Macintoshes to a single storage device, without remote user interface. Security is maintained by extensive password protection and optional data encryption. Add remote 10-Packs or Remote 50-Packs to support additional users. Compatible with both Systems 6 and 7, Retrospect lets you keep your data safe while making the transition. **Retrospect 1.3 UTI0227 $159. Retrospect Remote UTI0196 $269. Retrospect Remote 10-Pack UTI0200 $148.**



MUSIC & SOUND

Coda Music Software
❼MUS0044Finale 2.6.1 549.

Fifth Generation System
❼UTI0120 DiskLock 118.
Kensington
ACC0235 Apple Security Kit 34.
PassProof ea 69.
Kent Marsh
❼UTI0212 FolderBolt 79.
❼UTI0028 MacSafe II 107.
❼UTI0064 NightWatch 1.03 86.
Microcom
❼UTI0093 Virex 59.
❼UTI0150 Virex 10-pack 429.
Symantec Corporation
❼UTI0214 Symantec Antivirus for Mac 3.0 (SAM) 65.

UTILITIES & PROGRAMMING

Abbott Systems, Inc.
❼UTI0236 Calc+ 39.
❼UTI0113 CarOpener 62.
Advanced Software
❼UTI0192 Intouch 39.
Aladdin Systems
❼UTI0145 StuffIt Deluxe 2.0 62.
ALSoft
❼UTI0132 DiskExpress II 2.07 55.
UTI0110 MasterJuggler 1.5 55.
Baseline Publishing
UTI0182 Exposure Pro 78.
❼UTI0238 Init Info Pro 39.
❼UTI0187 INIT Manager 34.
❼UTI0190 Personality 49.
UTI0183 ScreenShot 34.
Berkeley System Design
❼UTI0119 After Dark 2.0 29.
❼UTI0230 More After Dark 25.
❼UTI0231 More After Dark/ After Dark 2.0 Bundle 45.
❼UTI0074 Stepping Out II 2.02 55.
CE Software
❼UTI0188 Quickeys 2 v.2 94.

Screenshot
(Baseline) Makes capturing the image simple and easy. Hit the user-definable key combination and the CDEV pops up a menu to specify whether you want to print it or save it. It captures whole screen, windows, menus, or selected portions of the display. **UTI0183 $34.**

INIT Manager Determines which INIT is crashing your system. Works as a CDEV and as an application. When it finds problems, it disables the offending INITs so you can resolve the conflicts. **UTI0187 $34.**



INIT Info Pro
The most complete list of INIT and application conflicts in existence. Includes hundreds of pages of facts and provides HyperCard stacks which examine all the drives connected to your Mac and complies a report of the problems. **UTI0238 $39.**

Excel 3.0
(Microsoft) ❼ Perform goal seek analysis, automatically link and consolidate worksheets, and produce stunning output in seconds with Excel 3.0, the most powerful analytic tool for the Macintosh. Achieve high-performance spreadsheet capabilities along with charting, database, and custom development tools created for the novice and power user alike. Features unparalleled power, advanced analytical and charting tools, and easy database access all in an ideal development environment. **BUS0167 $309.**



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ColorStudio 1.5 With Shapes (Letraset) ❶ ColorStudio 1.5 With Shapes provides the tools you need to create ads, logos, package designs, brochures, and presentation graphics on your Mac, without pasteups and light tables. Its anti-aliasing ensures smooth output for both print and video. New features include a full CMYK viewing and editing mode and support for Photoshop-type and other third party plug-ins. Version 1.5 also includes ColorCalibrator, a utility for optimizing output, and colorTalk for creating your filters and effects. The shape extension turns type into graphic objects you can bend, stretch and paint. **GRA0151 $599.**



Connectix
UTI0148 Hand-Off II 1.1.3 56

Custom Applications
❶UTI0136 Freedom of Press 3.0.1 255
❶UTI0185 Freedom of Press Light 3.0.1 55

Dantz Development
❶UTI0227 Retrospect 1.3 159



DeltaGraph Professional (DeltaPoint) ❶ DeltaGraph Professional provides over 35 chart types. Advanced features include extensive formatting options, built-in custom chart templates, CMYK color, and System 7 compatibility. DeltaGraph Professional also offers text outlining, bullet charts and a built-in slide show feature. **BUS0187 $199.**

❶UTI0196 Retrospect Remote 269
❶UTI0200 Retrospect Remote 10-Pack 148

Dariana Software
❶UTI0218 MacSlueth 89

Dubl-Click
UTI0194 ClickChange 59

Fifth Generation Systems
❶UTI0063 FastBack II 2.5 125
❶UTI0087 SuitCase II 1.2.1 49

Insight Developement
❶UTI0098 MacPrint 1.2 95

Magic Software
❶UTI0077 Autosave II 2.0 26

Microcom
❶UTI0191 911 89
❶UTI0233 Citadel 93
❶UTI0140 Complete Undelete 49

Microsoft
LNG0030 QuickBASIC 64

Now Software
❶UTI0167 Now Utilities 2.0 89
❶UTI0168 Screen Locker 45

ON Technology
UTI0142 ON Location 75

Salient
❶UTI0179 DiskDoubler 3.7 49

SNA
UTI0207 Offline 2.0 65

SuperMac
❶UTI0203 DiskFit 2.0 65

Symantec Corporation
UTI0151 Norton Utilities for the Mac 85
UTI0078 Symantec Utilities for Mac II (SUM) 96
❶LNG0051 THINK C 5.0 199
❶LNG0002 THINK's Pascal 3.0 165

Zedcor
❶LNG0031 ZBasic 5.0 99

WORDPROCESSORS & SPELLING CHECKERS

Ashton-Tate
WRD0009 FullWrite Professional 1.1 SPECIAL! 49

Baseline
❶SPL0029 Thunder 7 56

Caere
OmniDraft or OmniSpell ea 69
❶UTI0100 OmniPage 2.1 495

Claris
❶WRD0026 MacWrite II 139

DeltaPoint
❶WRD0032 TASTE 97

Deneba Software
SPL0015 Spelling Coach Pro. 3.1 124

Microsoft
❶WRD0022 Word 4.0 245

Nova Development
❶WRD0044 American Handbook of Business Letters 32
❶WRD0043 English Writing Guide 39
WRD0045 Instant Library of Quotations 32

Paragon
❶WRD0029 Nisus 3.05 245

Petroglyph
WRD0046 Editorial Advisor 79

Reference Software
❶SPL0023 Grammatik Mac 2.0 59

Sensible Software
SPL0018 Sensible Grammar 51

SNA, Inc.
WRD0033 Stylist 51

T/Maker Co.
❶WRD0018 WriteNow 2.2 w Grammatik/MacTools 99

WordPerfect
❶WRD0041 WordPerfect 2.0 279

WordStar
SPL0028 Correct Grammar 2.0 55

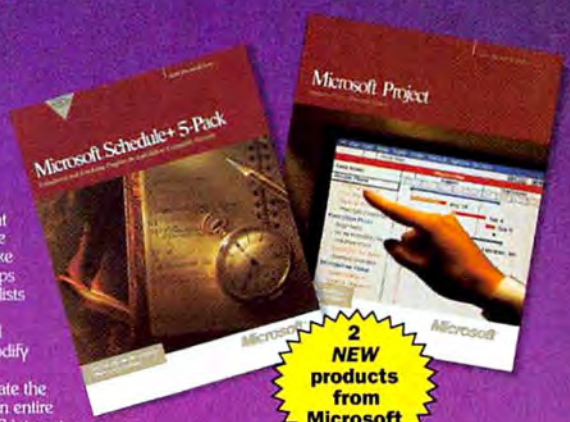
Calc+ (Abbott Systems) ❶ A next generation calculator, with powerful decimal and Desktop Publishing function. It's fast, easy to use and has all the features of a professional desktop calculator multiline resizable display, paper tape, fast operation from the Mac's numeric keypad or regular keyboard. It can also perform desktop publishing calculations in inches, centimeters, picas and ciceros and do instant conversions between any of these units. **UTI0236 $39.**



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2 NEW products from Microsoft

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In the not-too-distant future, you may be able to create printing plates directly from the Macintosh, eliminating traditional prepress steps such as producing imagesetter films, stripping, and manual plate making. Computer-to-plate imaging is still in its infancy, and the players include Printware, Polychrome, and Gerber Scientific Instrument. Printware already offers the 1440 MP Platesetter ($74,990), and Monotype and Autologic both plan to market the Direct-to-Plate LE55 Imager developed by Gerber and Hoechst AG.

By Aileen Abernathy



Scanner skinny: Finally, an application that supplies the missing link in the color WYSIWYG chain from scanner to monitor to printer. ScanMatch, from Savitar ([415] 243-3030), provides calibrated color between flatbed scanners and the computer screen, using proprietary RGB transformations and monitor data supplied by TekColor (see image before and after calibration, right). A steal at $149, ScanMatch comes as a stand-alone application as well as a Photoshop plug-in. Watch for several scanner makers, including Microtek, to announce bundling deals. ✘ Meanwhile, Howtek has slashed the price of its Personal Color Scanner from $2,595 to $1,295 — making it the best deal around on a 300-dpi, 24-bit flatbed unit. Direct sales only. (800) 444-6983.

The best of both worlds? Quark has released a beta version of PM Import, an XTension that lets you import PageMaker 4.0 documents into QuarkXPress 3.0. The free filter is available through on-line services (such as CompuServe), but be forewarned: In its present form, PM Import is strictly a toy. Its limitations range from crashes to the inability to import PageMaker features such as text formatting, tracking, manual kerning, style sheets, rotated text, and indexing. Document interchangeability is a desirable goal, and the filter does show promise — it correctly converts master pages, for example — but thus far PM Import is just a tantalizing bit of vaporware.

Product news: Solutions has officially axed Curator, its venerable art-cataloging program. For $69, however, Curator orphans can upgrade to Mariah, a mixed-media cataloger from Symmetry Software ([800] 624-2485) that preserves Curator keywords. ✘ You can navigate through most of PageMaker's features with a keystroke (or two), using Hot Keys, a set of predefined Fkey macros from GO Technology ([800] 468-5391). This $59.95 utility lets you assign fonts from the keyboard and quickly access undocumented commands such as printing with the Apple driver. GO Technology also offers Hot Keys versions for Personal Press and most word processors.

TrueType casting: TypeStyler does TrueType — along with balloon help and publish-and-subscribe. Version 2.0 of Brøderbund's type-manipulation program also sports faster printing and screen-rendering times, vastly improved color support, on-the-fly font conversions, and double Bézier curves. ✘ If you want to design or edit TrueType fonts, version 3.3 of Fontographer (Altsys) lets you perform these tasks for the Mac and the PC. (FontStudio 2.0 can also create TrueType fonts but only for the Mac.)

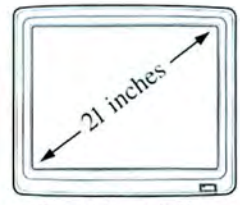
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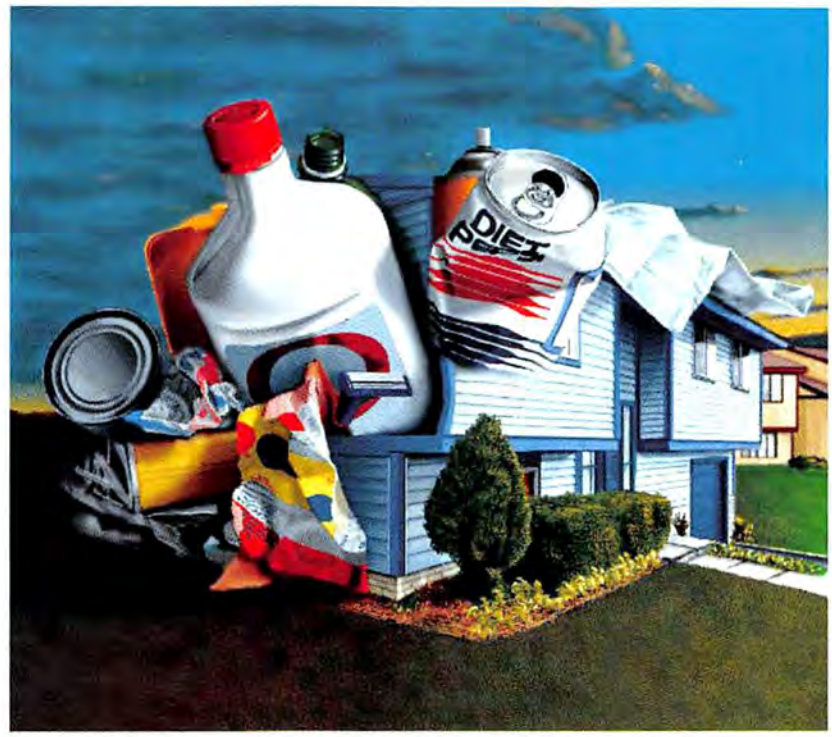
The skillful use of a painting program's special effects can produce award-winning results.

By Janet Ashford

There's no substitute for painting skill — and no doubt that David Burwinkel, a Bridgeville, Pennsylvania-based designer, has skill to spare. But instead of oils, Burwinkel used PixelPaint Professional to create *Suburban Waste*, which won the Third Annual PixelPaint Art Competition. Not even a high-end painting program can turn a graffiti artist into a Rembrandt, but if you have a good eye and nimble fingers, PixelPaint Professional's powerful special effects will reward your efforts. (Burwinkel used version 1.0 of PixelPaint Professional; version 2.0 is now shipping.)

Burwinkel began with a pencil sketch of his dream house. He roughed in a first layer of color by using the paint-bucket tool to fill large shapes and then carefully added modeling, texture, and highlights to the various elements. The richly detailed look was produced by use of techniques such as masking, drawing in special-effects modes, and creating custom-shaped brushes. Similar features are available in other painting and image-editing programs, including Studio/8 and Studio/32, UltraPaint, ColorStudio, and Photoshop.

Graphic designer Janet Ashford coauthored *The Verbum Book of PostScript Illustration.*



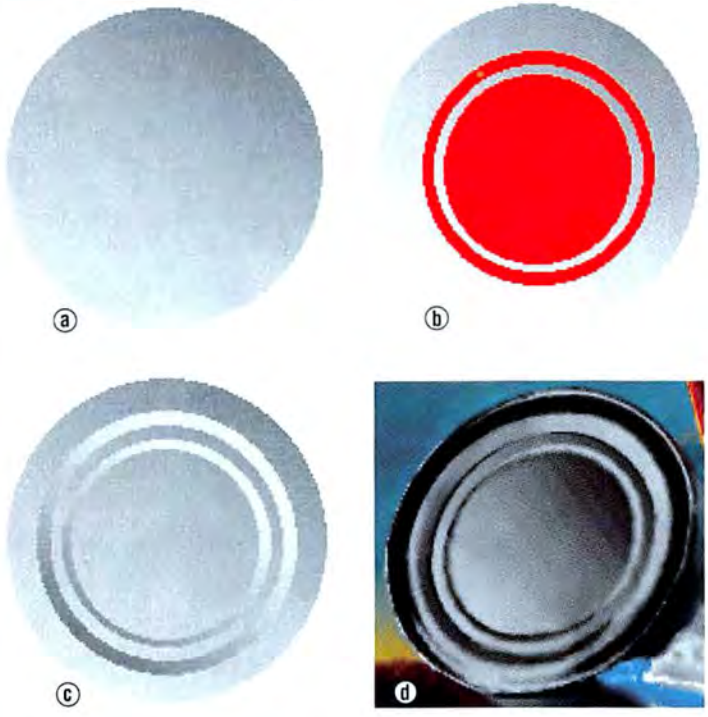
David Burwinkel's *Suburban Waste* won Best of Show in the Third Annual PixelPaint Art Competition. The digital painting makes an environmental statement, depicting a house extruding giant bottles, cans, and other suburban trash.

1 Adding Flat Color to a Sketch

A rough pencil sketch is scanned, opened as a template in Illustrator 3.0, and manually traced with the freehand tool. (A drawing program such as FreeHand or Canvas could also have been used for this step.) The artwork is then opened in PixelPaint Professional, where colors from the standard palette are used to fill large closed areas. As his rough color composition progresses, Burwinkel edits the palette to create the colors he wants.



2 Making the Tin-Can Lid



To create the realistic-looking tin-can lid, Burwinkel begins by drawing a circle with the filled-oval tool, which is used in Fill Effect mode so that the circle is automatically filled with a gradation. The gradation is specified as a left-to-right blend of 20- to 40-percent black (a).

Next, a mask is created on top of the circle with the filled-oval tool in Mask Only mode. Two circles are drawn, one inside the other, so that the result is a filled circle with an outer ring (b). The mask (shown in red on-screen) protects the image under it from further changes.

Switching to Use Mask mode, Burwinkel draws a second circle — smaller than the outer circle but larger than the mask — in the painting layer and fills it with a gradation in the opposite direction, from 60- to 10-percent black. Although you no longer see the mask on-screen, it still protects the original circle. As a result, the new gradation appears only as two concentric rings, because those are the only unmasked areas (c). (A similar effect could have been achieved without masking, by drawing five overlapping circles filled with gray gradients in alternating directions.)

The "can lid" is selected and skewed slightly to the right with the Slant effect, and then final details and highlights are added by use of the brush and curve tools (d).

3 Creating Perspective



To produce the perspective effect needed for the house's horizontal siding, Burwinkel uses the brush tool in Polygonal Path mode to draw lines across the image toward an imaginary vanishing point off-screen to the right. (In Polygonal Path mode, PixelPaint's brush tool draws straight lines between two click points.) Masks protect the areas where the bushes, trash, and inside porch walls will go. The lines that bleed off the house onto the background are deleted.

4 Adding Depth Cues



We know that an object is far away not only because it's smaller than closer objects but also because its edges are less distinct. To add a depth cue to the background house at the right of the image, Burwinkel selects and blurs the house, using the polygon tool with the Diffuse effect applied. He uses the same technique to soften the aerosol can behind the soft-drink can on the main house.

5 Adding Dimension to Flat-Color Areas



(a)



(b)



(c)



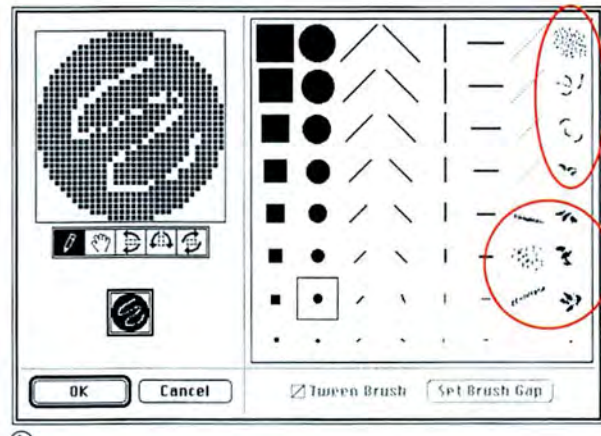
(d)

Burwinkel creates the crumpled paper on the left-hand side of the house by first filling black-and-white outlines with areas of flat color (a). Then he makes the colored areas look three-dimensional by drawing over sections with the filled-polygon tool, which has either the Lighten or the Darken effect applied (b). These special effects increase or decrease the color saturation of selected areas by user-specified amounts without changing the underlying hues. Additional details are painted with the brush tool, and the water-drop and finger tools are used to soften the edges between color areas (c and d).

6 Creating Texture with Custom Brushes



(a)



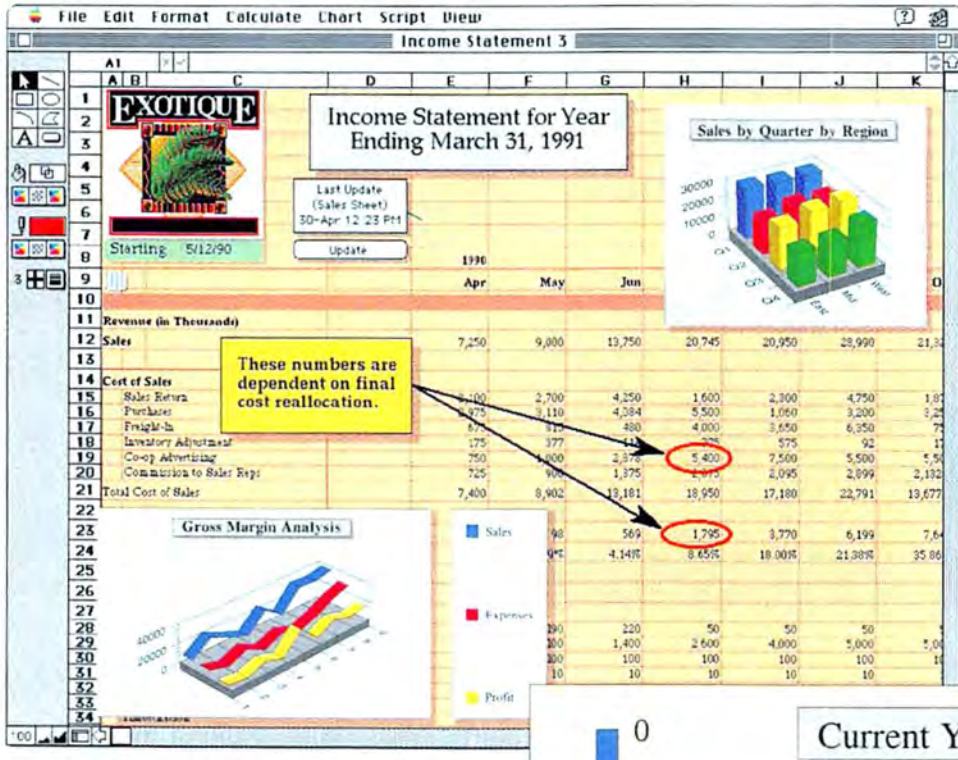
(b)



(c)

The highly textured bushes and grass in front of the house (a) are created by painting the basic shapes in a midtone green and then "stamping" over them with custom brush shapes in lighter and darker greens. Most painting and image-editing programs let you create custom brushes by editing the "footprint" of the brush pixel by pixel. Using PixelPaint Pro's Brush dialog box, Burwinkel edits several of the preset brush shapes to create the textures he wants (b; see red circles). (This dialog box is from version 1.0; version 2.0 has a different editing interface.) For example, he creates fat and thin leaf-shaped brushes (c). To create leafy highlights, he stamps fat shapes in a darker green and then stamps over them with the thin-leaf brush in a lighter green.

The only thing missing from our new spreadsheet is the learning curve.



Application

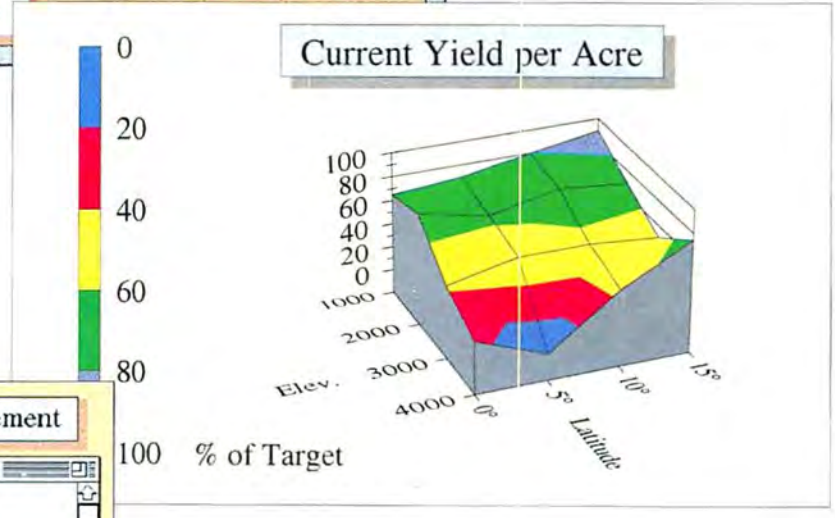
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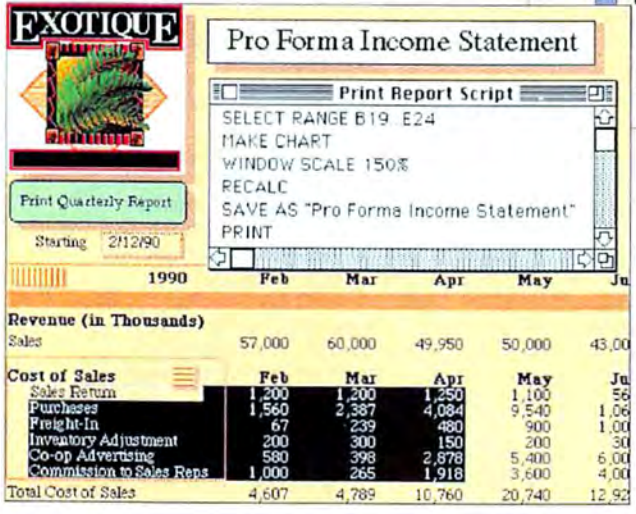
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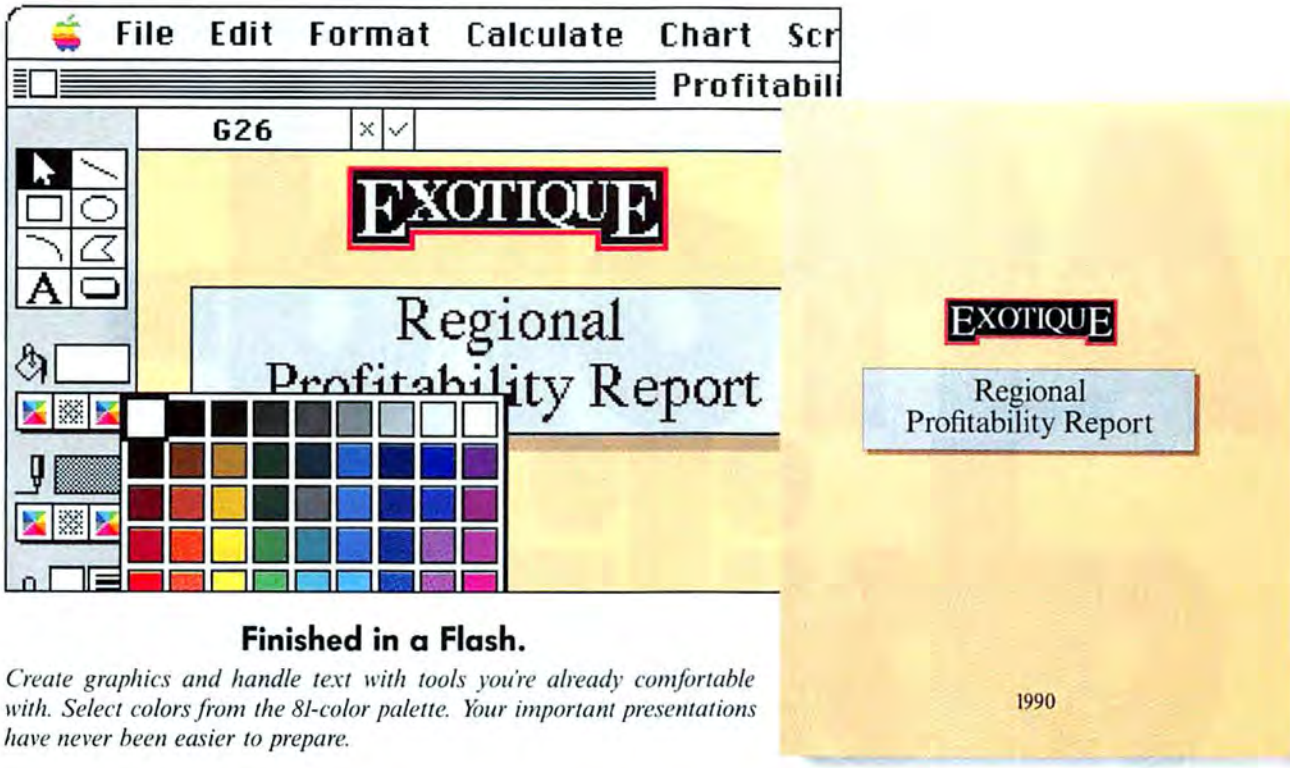


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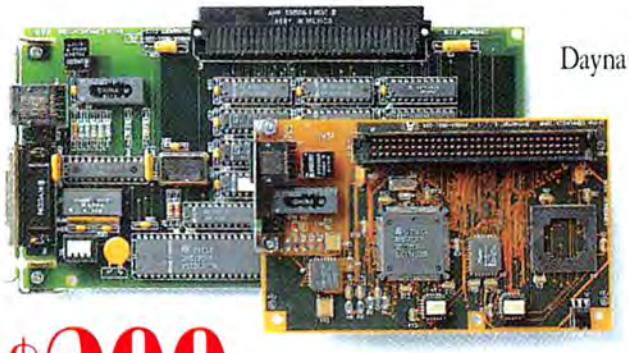
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CIRCLE 133 ON READER SERVICE CARD.



At the recent Mactivity '91 conference, the versatility of the AppleTalk networking system was demonstrated by using its protocols to brew coffee over a network. (Don't try this at home, kids.) Shiva was rumored to be so excited by the demonstration that the company is considering remarketing its vintage-model FastPath 4 as a networkable hot plate. Pricing wasn't available at press time.

By Henry Bortman

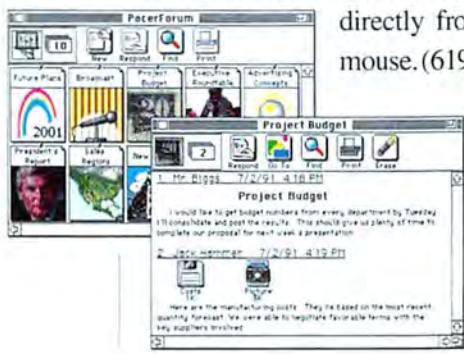
Another hot box: Check out Silicon Graphics' new IRIS Indigo personal computer. The ACE-compatible, RISC-based (MIPSR3000A) computer is the fastest implementation of Display PostScript available. Other specs: 8-bit video on a 16-inch color monitor, 16-bit DAT-quality audio, Ethernet, 8 megabytes of RAM, and a 236-megabyte hard disk. All this for $9,995, in a box the size of a Mac Classic (except for the monitor, of course).



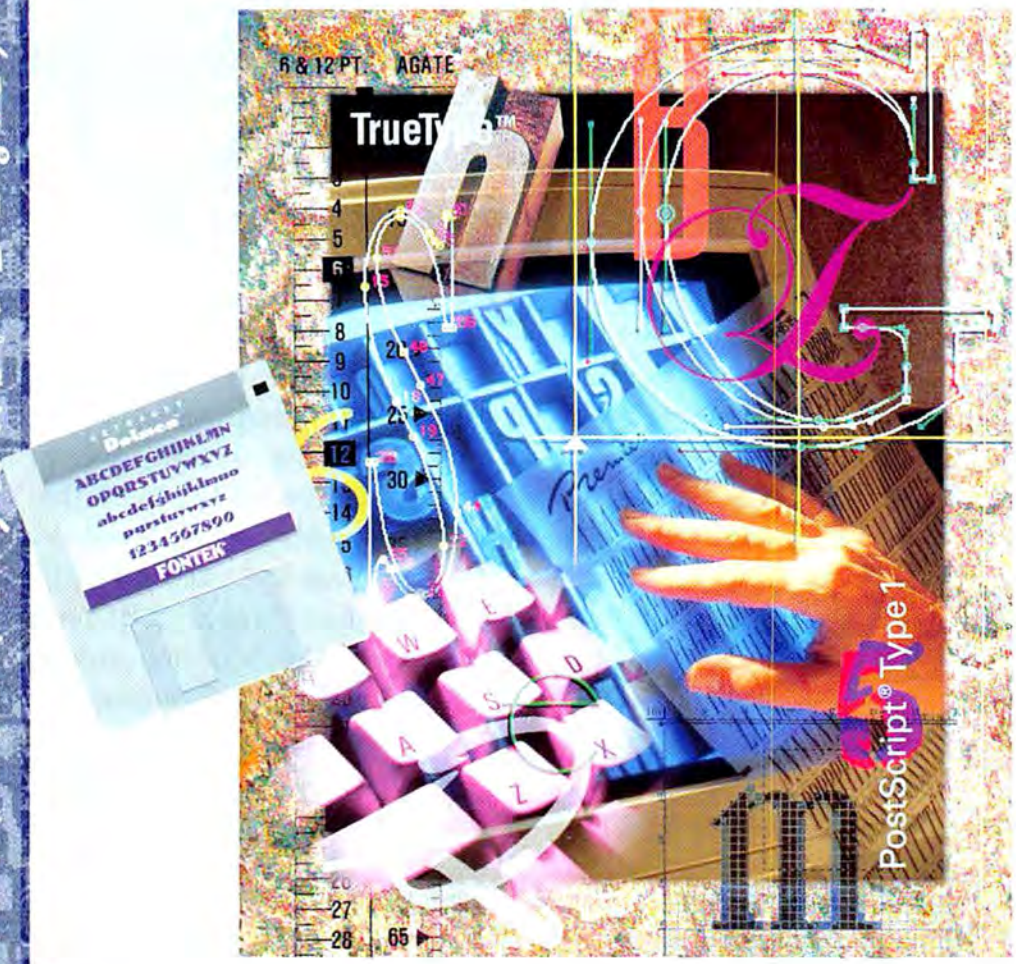
Router checkups: While you're waiting for Apple to rationalize AppleTalk-network management, Neon Software ([415] 283-9971) has a solution for you. RouterCheck ($649) gathers network and zone information from most popular AppleTalk routers and can warn you about conflicts. It also provides graphical traffic statistics for selected routers. ✘ And if you're looking to extend your LAN to a WAN, check out Engage Communications' SyncRouter/LTi ($2,495). This addition to Engage's line of synchronous WAN routers supports network-to-network connections over dedicated 56K digital phone lines. (408) 688-1021.

Product news: XGator ($495), from Cayman, and Planet X ($295), from InterCon, bring X Window client capabilities to the Mac. With either product, you can display Mac screens and control Macs remotely over Ethernet from a UNIX workstation or X Window terminal. It's kind of like Timbuktu for UNIX. Planet X is a control panel and supports color, whereas XGator is a monochrome-only application — but color's coming soon. ✘ Want to put your serial- or SCSI-connected personal laser printer on the network but don't want to buy additional hardware? Try Gizmo Technologies' ShadowWriter ($179), a software-only solution for printer sharing. It currently works with Apple's Personal LaserWriter LS and SC and with the LaserWriter IISC. (415) 623-7899.

But is it groupware? If you're tired of using electronic mail for in-house conferencing, try Pacer's PacerForum ($549 for a five-user pack). Like a dial-in bulletin-board service, PacerForum organizes group discussions into topics. As with E-mail, documents can be attached to responses, but unlike with any currently shipping E-mail package, System 7 users can open the documents directly from within PacerForum, with a mere click of the mouse. (619) 454-0565. ✘ International Business Systems ([800] 733-2822) is shipping version 2.0 of its DataClub distributed virtual server, which supports System 7 and fixes several problems that hampered the initial release. DataClub Dedicated is also now available for those who want the advantages of a virtual server without the potential problems of distributed data.



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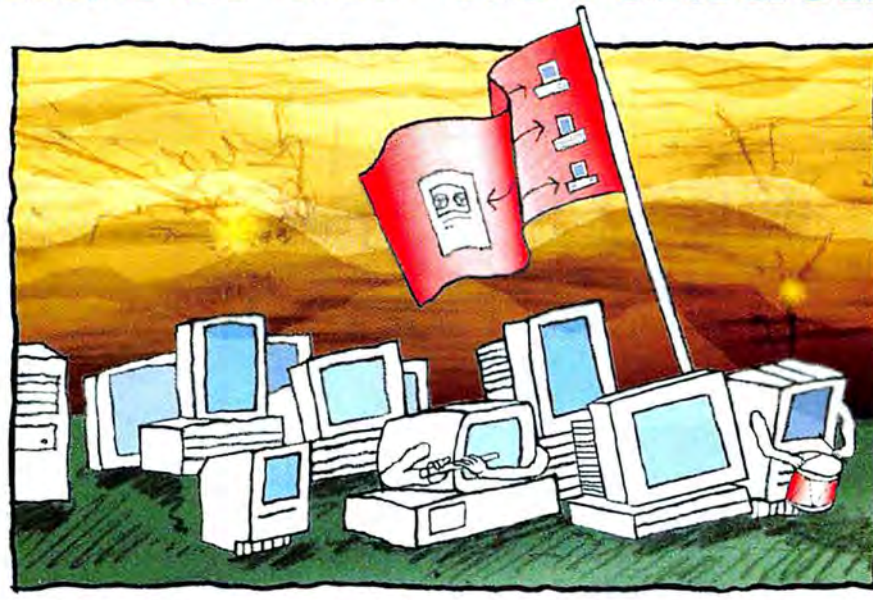
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CIRCLE 398 ON READER SERVICE CARD.

The Client/Server Revolution

By combining the power of mainframes with the Mac's ease of use, client/server technology is revolutionizing database management in the '90s.

By David Beaver



The Macintosh has long had a reputation as a "weak" database computer: The software required was too slow, too complex, or too short on important capabilities. But this reputation is changing fast. A whole new database technology, known as *client/server* software, can put incredible database power behind your favorite desktop computer. Even if your database contains hundreds of thousands of records, a hundred users are accessing the database at the same time, or your network consists of a mixture of Macintoshes and PCs, client/server technology can give users fast access to the data from their desktop.

The Best of Both Worlds

In client/server computing, the server is a central computer containing database software that plays host to a network of client Macintoshes. In essence, this technology combines the best features of personal computers with the best features of mainframes while eliminating the drawbacks of each. To understand the benefits of client/server technology, you need to understand the strengths and weaknesses of desktop computers and mainframes, especially in relation to database management (see Figure 1).

The Mainframe. Mainframe computers (and the smaller versions known as minicomputers) are the high-end-computing technology that large organizations use. A mainframe consists of a powerful central processor connected to several "dumb" terminals (dumb because they are helpless without the mainframe). The central machine does everything for all users: It stores the data, runs the programs that manage the data, and generates the screens displayed on the terminals.

A mainframe can manage a lot of data very quickly, and because everything is stored in one place, all users can access the same data. Mainframe software does have some weaknesses, however:

- The user interfaces generally aren't very friendly.
- It can be difficult for users to access data and manipulate it in the way they want to.
- Data-analysis tools, such as spreadsheet and charting software, are hard to use on a mainframe — if they're available at all.

The Personal Computer. The difficulties of dealing with mainframes are all reasons personal computers such as the Mac became popular in the '80s. A desktop personal computer runs user-friendly software that lets you manipulate your own data with spreadsheet and other applications, and it slows down only when *you* make it work hard.

With the advent of LANs (local-area networks), desktop-computer users were able to share information among themselves by using file servers. Broadly speaking, a file server is a central computer running special software (such as a Mac running AppleShare) that stores files that all the users on the network can then access. All the leading personal-computer database managers — 4th Dimension, Omnis 5, and FoxBASE/+Mac in the Mac world and

dBASE and Paradox in the DOS one — can use file servers to share data among several users (for more on file-server database management, see "The Data Duelists," June '90, page 88).

Unfortunately, using file servers can be an inefficient way to manage data. Although the file server knows about the files stored on it, it knows nothing about the data stored in those files, so when you use a file-server database, all the real work takes place on your desktop computer. For example, say you want to find all the people in your database named *Garcia*. When you click on the Search button on your screen, your Macintosh sends a command to the file server that says something such as "Give me all the people in the database so I can look at them and decide which are Garcias." The file server dutifully sends every name in the database across the network, one at a time, and your desktop computer processes the data. Needless to say, this slows down performance considerably.

For acceptable speed, file-server databases require a lot of expensive hardware, especially if you have large data files. The file server should be a fast computer (a 68030-based Mac, such as a IIci) with a fast hard disk, so it can put the data onto the network quickly. Every user's desktop computer has to be fast as well (preferably an SE/30 or a more powerful Mac), because that's where the real database work happens. And if you access the database a lot, a powerful Ethernet network is a better pipeline than LocalTalk, because it gives you faster performance.

File-server databases have other weaknesses too:

- Remote access via dial-in modem is slow and cumbersome, because of the large amount of data that moves between your computer and the file server.
- There's no easy growth path as your database needs increase, because you have to upgrade (by adding accelerators, for example) or replace every machine that accesses the data and there are limits to the performance of a file server.

The Client/Server Solution

With client/server technology, you get around the problems of the mainframe and the personal computer by installing a *database server* on your network. A database server is a computer (anything from a Mac SE/30 to a mainframe) running powerful database software that — like a mainframe but unlike a file server — has intelligence about the data it stores. The desktop machines, which can be any desktop computers and which are known as *clients*, run software that sends database-search commands to the server and deals with the resulting data, using a friendly interface.

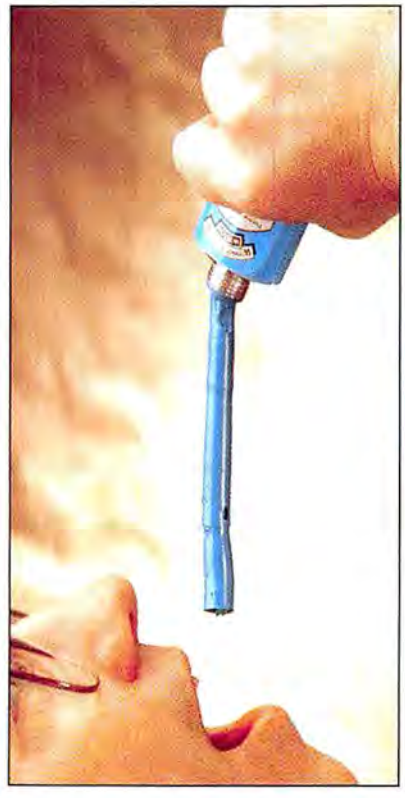
To find all the Garcias in a client/server environment, for example, the command your computer sends to the server is simply "Find all the Garcias, and send them to me." The database-server software sees

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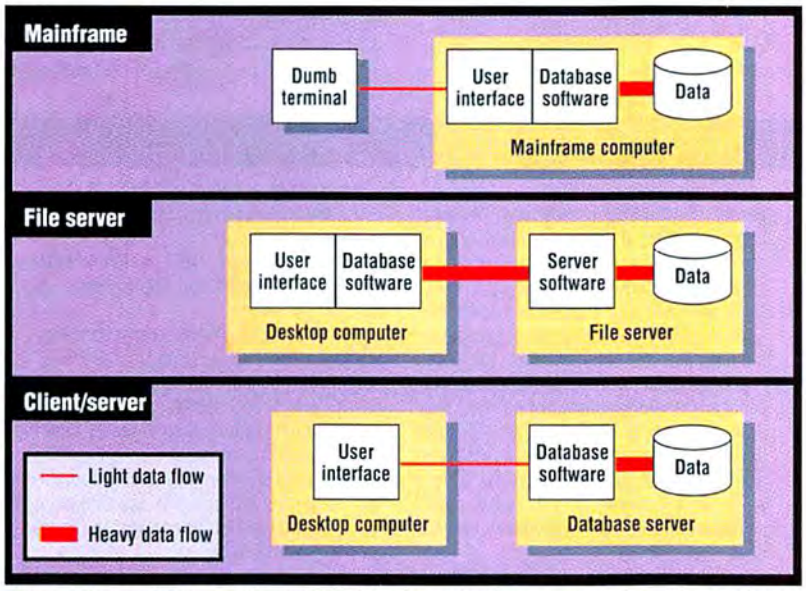


Figure 1: In a mainframe environment (top), a heavy load can cause performance problems. In a file-server environment (middle), performance can also be slow. In the client/server environment (bottom), only data requests and the resulting data travel across the network.

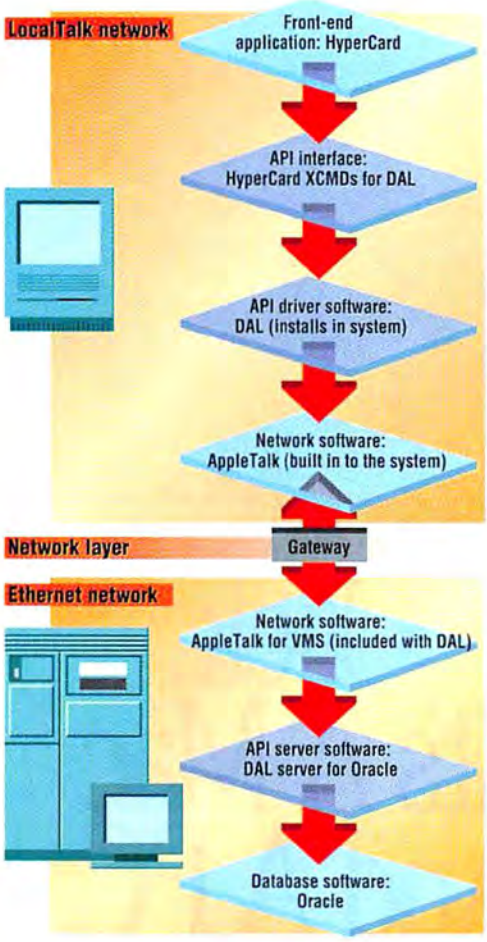


Figure 2: A client/server environment consists of several complex pieces, all of which must be compatible. Here, a HyperCard stack is used to access data in an Oracle database on a VAX, with Apple's DAL software as the critical API layer.

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that command, goes out to its own hard disk to search for all the Garcias, and then sends just those records back across the network. The application on your desktop machine then takes care of displaying the names through a friendly interface.

Client/server database managers are much faster than those used with file servers, for several reasons:

•The heavy database work occurs on the central machine, so each user doesn't need a high-end personal computer to get reasonable speed. If you need faster performance, you need only upgrade the server.

•Dial-in-modem access is practical, because smaller quantities of data are being brought from the server to the client machine.

•Because much less data is moved across the network, Ethernet networks aren't required. (The speed tests in "The Invisible Bridge to Mainframe Data," January '91, page 138, showed that Ethernet is barely faster than LocalTalk in a client/server environment.)

The Power of the Server

A server-based architecture offers another important benefit — the server and the client are totally separate machines. As long as they speak the same language, it doesn't matter what kind of computer is at

What It Costs

The cost of a client/server system depends on what you already have and what you're used to. If you're downsizing from the minicomputer world, the cost and complexity of the hardware and software needed for a client/server database will seem reasonable. But if you're upsizing from a file-server database, be prepared for much higher costs in return for increased performance. The higher costs are because several components are required and because you'll need to hire a consultant to install and administer the system. When planning a large client/server system, expect to spend as much as $2,500 per user. Here's how the cost breaks down:

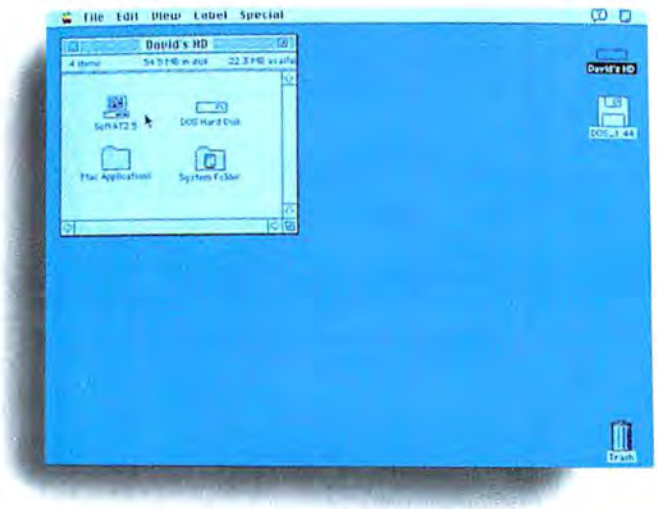
•**Server hardware.** About $1,000 per user for the server hardware itself — that is, $50,000 for enough hardware to support 50 simultaneous users. The cost depends on your database's size and how you use it.

•**Database software.** Up to $1,000 per simultaneous user. The cost depends on the server you're using.

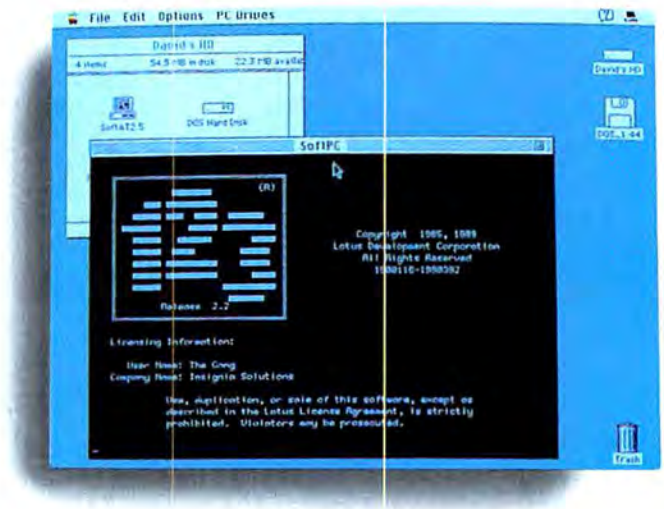
•**Client software (API, network software, and the front-end application).** Up to $500 per user.

One benefit of client/server technology is that you can start small and increase your horsepower as your business grows. The new Oracle Server for Macintosh, for example, might support as many as 20 users on an AppleTalk network with a Mac IIfx database server. When you need to upgrade to a larger server, you can use the same front-end application to connect to Oracle on a bigger machine.

These costs are similar to what you'd pay for comparable performance from other technologies. A minicomputer-based system sufficient to handle 25 users can cost around $150,000, for example.



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each end. A database server can be any kind of computer, depending on your needs and budget — a Mac SE/30, a $50,000 VAX or Sun workstation, or a $1 million mainframe. And with the right software, any desktop machine — a Macintosh, an IBM PC, a UNIX machine, even one using the new GO operating system — can connect to this server and share the same central database. This means that as an organization grows and the database gets bigger, the server hardware can be upgraded easily, virtually without limit and without any change in the users' desktop computers.

Another advantage of client/server databases is that the database server doesn't know (or care) what software is talking to it, so you can use a wide range of products on the desktop, depending on the task. For example, different users can have different interfaces to the same data, as appropriate, because the user-interface program is separate from the database itself. These interfaces can be written in a variety of development languages, such as that of ACIUS' 4th Dimension, Claris' HyperCard, or Omnis 5, from Blyth Software. A common approach in a client/server environment is to build one interface for users doing data entry, another for users who need reports on the data, and a third for managers who need quick access to certain key data.

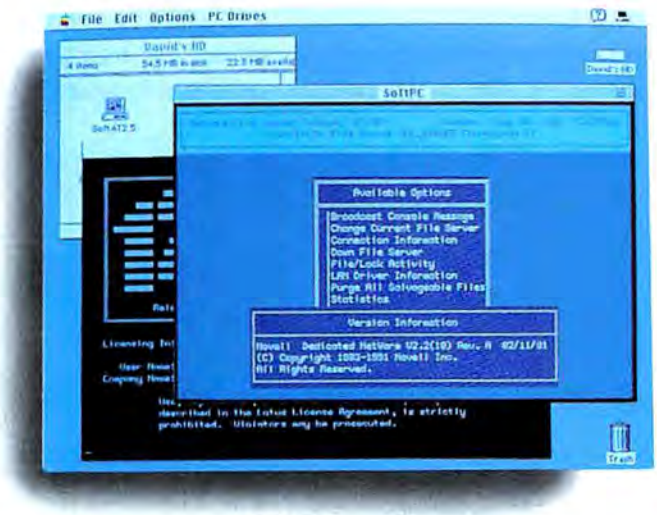
Client/server technology is important to mainframe and desktop-computer users alike. Desktop-computer users can move up to a client/server environment when they outgrow a file-server database; mainframe users can downsize to a client/server environment by moving databases off heavily used mainframes and onto smaller servers or by supplementing mainframe applications with new user-friendly front-end programs on desktop computers.

Picking Up the Pieces

With all of its power, a client/server database is more complex to set up than a file-server database (for prices, see the "What It Costs" sidebar). A client/server setup requires that numerous hardware and software products, often from several vendors, all work together in harmony (see Figure 2). Here are the various pieces you need:

The Server Computer. The server software must run on a computer that has the power and features to support the number of users and the amount of data you require. Popular choices for server hardware are Sun workstations and VAX minicomputers; these machines are, of course, much more complex and expensive than personal computers, but they can support dozens of users and multiple gigabytes of high-speed disk storage.

Until recently, it wasn't possible to use a Mac as a server: The Mac operating system didn't have the multitasking features that let the UNIX and VMS operating systems support multiple users, nor did it have the power to handle large amounts of data. This situation is changing fast, however. Two new products, Oracle Server for Macintosh and P•INK SQL, from MacVONK, have made the



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Mac a viable server platform for small networks. Both of these applications work under System 6 and System 7 and are easy to install and maintain on any Mac (high-end 68030 machines such as the Mac IIci are recommended).

With advances in computer-hardware technology, the line between desktop computers and minicomputers is blurring and the performance of a high-end Mac is very close to that of a comparably priced low-end minicomputer such as one in the Sun SPARCstation line.

The Database Software. The most important piece of the puzzle is the database software that runs on the server. It must be a multiuser database manager that is designed to be accessed in a client/server environment. Popular database-server products that run on mainframe or minicomputer servers include those from Oracle, Sybase, and INGRES. In addition, Oracle now has a version that runs on a Mac server, and ACIUS and Fox, among others, are working on database-server software that runs on Macs. For the most part, however, the server products you can choose from are products from the world of mainframes, and with rare exceptions, they all use the SQL (Structured Query Language) database language. (Developed in the late '70s, SQL is a language for phrasing complex database commands in a relatively simple manner.)

These server products offer powerful features not found in any database manager used with a file server:

- They can be connected to other similar servers in a WAN (wide-area network), letting data be distributed to several different sites in an organization. In a client/server environment, for example, if your local server can't find the information you need, it can "talk" to a server in a remote location, get the required information, and send it to your desktop computer.
- The software usually has sophisticated data-integrity features to ensure that data is not corrupted in the event of hardware problems or power outages. Database activity can be automatically logged on a backup volume such as a disk or tape drive, and complex database transactions can then be re-created from these logs.
- You can configure the software to suit your needs. If, for example, you have a lot

Table 1: Mainframe, File-Server, and Client/Server Setups

	Pros
Mainframe	•Can manage and store large amounts of data.
File server	•User-friendly database software on desktop computers. •The easiest and cheapest option to set up and administer.
Client/server	•Software running on client computers has friendly interface. •Because less data goes across a network, it's faster than a file-server setup. •Ethernet not required. •Can access database via modem. •Server can be upgraded easily, as needed.

of users accessing a small amount of data, you can optimize your server's memory, central processor, and disk usage for this particular situation.

Unfortunately, this sophistication has a price in user-friendliness. None of these products is as easy to install as a file-server database manager for use with a file server, and they all need to be installed, tuned, and managed by a skilled administrator.

The Network. A network connection must be established between the desktop computer and the database server, and depending on the server hardware you choose, this can get pretty complex. Big server machines, such as Suns and VAXes, do not support LocalTalk wiring and require an Ethernet connection and a router to connect your LocalTalk and Ethernet networks. On top of this, you probably need to run different network protocols, such as TCP/IP or DECNet, on your Mac to establish the connection to these servers. This network software is included with some of the client/server software.

Establishing a network connection is easier in an all-Macintosh environment. The database managers for Macintosh servers — Oracle Server for Macintosh and P•INK SQL — use LocalTalk networks, but they can't be accessed by DOS machines.

The API. Even when all the hardware and software pieces are in place and your network is set up, your desktop machine can't talk to a database server until you've installed a layer of software that lets them communicate. To do this, you need an API (application-programming interface) installed on both the server and the desktop computer. The API isn't an application itself: It's an invisible connection between your Mac application and the database manager on the database server. The API is the most confusing piece of the puzzle, as different database-software vendors offer, or work with, totally different products. If an API isn't available for the combination of software and hardware you'd like to run, nothing will work.

Apple's DAL (Data Access Language) is one API. Others include Oracle's SQL*Net; SequeLink, from TechGnosis; and HyperDB/Library, from Sybase. Each of these works with a different set of front-end languages on the desktop computer

Cons	Ideal Users
•Unfriendly user interface on terminals. •Users have limited access to data. •Few spreadsheet or charting programs available. •Slow when accessed by many users at once. •Expensive.	•Big companies with a lot of data and many users.
•Need fast computer for server and on desktop for acceptable speed. •Ethernet required for best performance. •Remote access via modem impractical.	•Small number of users on a network and low demand for shared data.
•Complex to set up. •More expensive than a file-server setup. •Needs to be installed and administered by a skilled administrator.	•Medium-sized to large companies that need fast access to a central database or that have several users accessing a database at the same time.

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and back-end database managers on the server, and the prices vary greatly (for more on these products, see "The Invisible Bridge to Mainframe Data").

Client Software. Most of the complexity of client/server technology is behind the scenes; users see only the software and screens that run on their own desktop computers. These front-end applications must be able to communicate with the server and display the returned data in a usable format, and either an off-the-shelf application or custom software can be used for this role.

If you're looking for an application that can communicate with a database server right out of the box, packages such as ClearAccess, from Fairfield Software, and GQL, from Anodyne Computing, are the best choices for searching a database and putting the results into a spreadsheet. If you need a custom system, say a true database application with entry screens and reports, you can program such a system in several environments. Many popular Mac programming environments, including 4th Dimension, Omnis 5, and HyperCard, can use add-in software modules to let them talk to database servers. 4th Dimension and Omnis 5 are particularly good development tools, because data that's brought down from the server can be stored in a local database for such uses as creating reports.

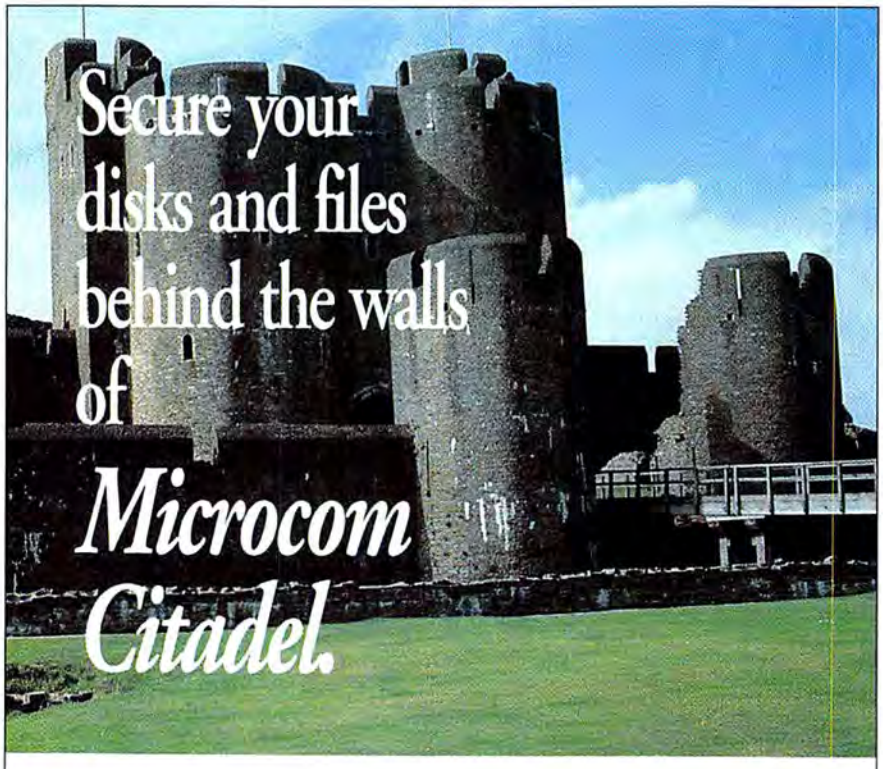
Unfortunately, designing applications with these products is not yet as easy as it should be. In all these development environments, some pretty complex programming and a good knowledge of relational-database design are required to develop a client/server application. Writing good client/server systems is still a new art, and programmers who cut their teeth on database applications for mainframe or file-server environments have to learn new design methods.

Things are bound to get better, though, because new products — such as Oracle Card, 4D SQL Server, and the upcoming server version of 4th Dimension — are making front-end applications easier to develop and more powerful. In the meantime, client/server technology won't really come into its own until programming a system is as easy as designing, say, a FileMaker Pro database.

The Technology of the '90s

Client/server technology promises to be one of the most important developments in the computer industry in the next decade. It will allow small businesses to improve their information systems without changing their existing personal-computer network, and it will let larger organizations move the processing load off big computers and onto personal computers — where it belongs. And it will, at long last, let all of us do serious data management through a friendly interface.

David Beaver is president of The Automation Group in San Francisco. His license plate reads MAC SQL.



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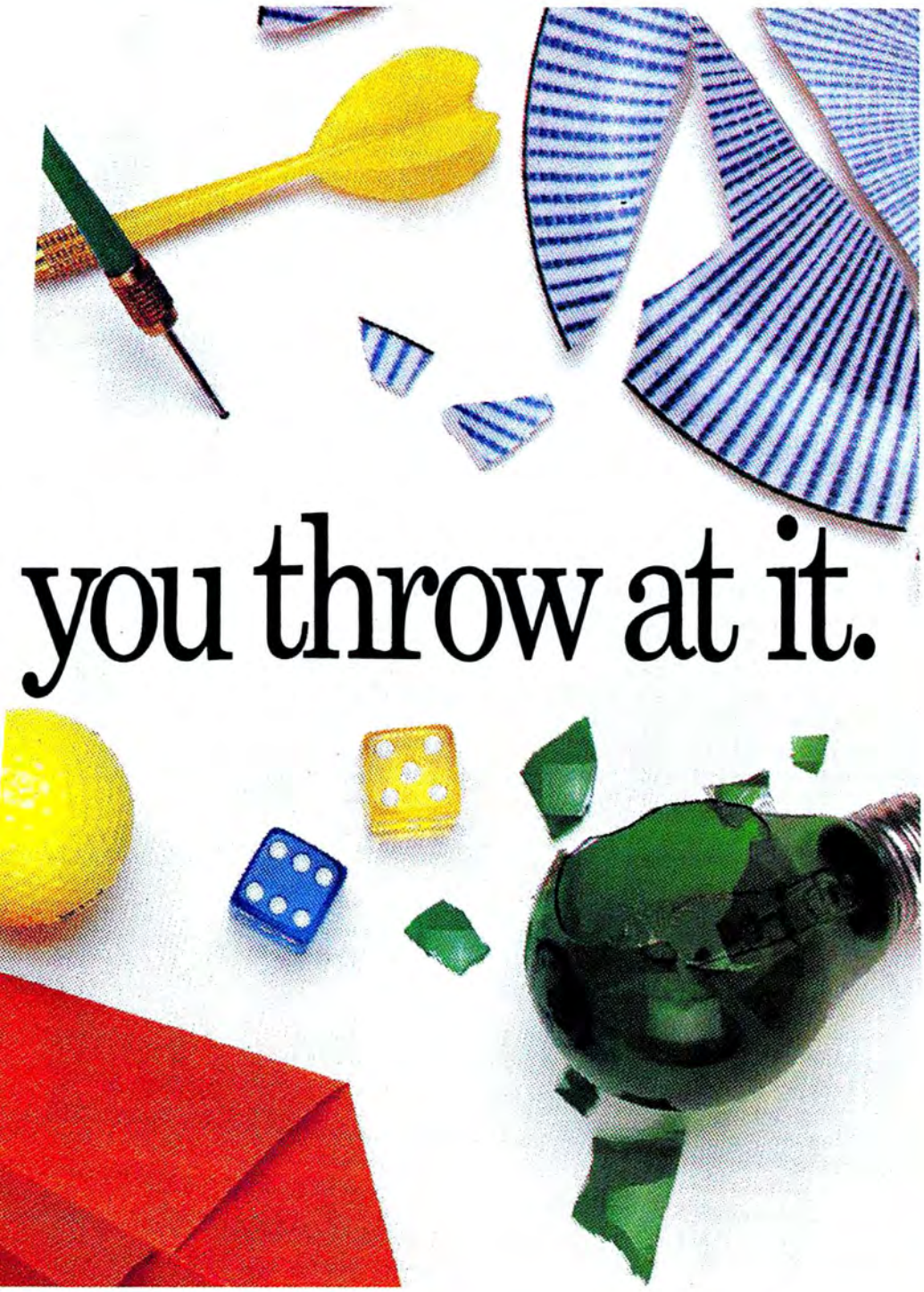
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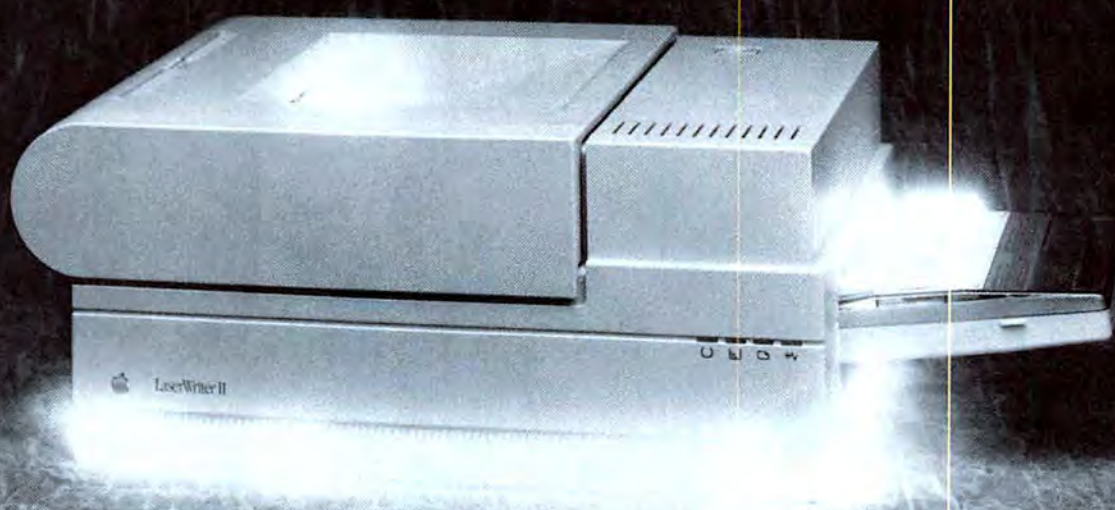
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Rogue Routers

All it takes is a single misbehaving router to lead 'good' routers astray, causing widespread network chaos.

By Kurt VanderSluis



AppleTalk routers are often a sore point for managers of large networks. Some of the features that make AppleTalk routing protocols easy to implement for a small network can cause major headaches in a large internet. AppleTalk offers the marvelous luxury of routers that can take a tiny seed of information (which networks and zones they're directly connected to) and, by exchanging this information with other routers, deduce the structure of the entire internet and intelligently route data packets through it. But all it takes is one poorly configured router to set off a cascade of network trouble.

Although routers can receive information about the internet from other routers, they aren't able to question whether the information they receive is true. A properly configured router can "learn" the structure of the internet from routers that have erroneous information and then "teach" this misinformation to other routers that are learning the internet structure.

If you manage a large network, you know how easily this can happen. You've tried to design an intelligent scheme for numbering networks and naming zones, and you've communicated this scheme to everyone who might need it. But it's impossible to know everyone in your company who might be building an AppleTalk network. Anyone can buy a router and — without telling you — slap it onto your Ethernet backbone and sow the seeds of chaos. Or maybe one of your own undertrained, overworked technicians will mistakenly configure a router with the wrong information. Large networks have more router problems, because of their size and complexity; unfortunately, it's also harder to diagnose and correct problems, because the ways in which an error can affect a large network are more numerous and unpredictable.

One network manager told me he planned to disable every AppleTalk router on his internet — more than 100 of them! — and reconfigure them one by one. Although this strategy would certainly solve his router troubles, such a Herculean task is unnecessary if you use the right investigative techniques. This month, I'll outline some methods for tracking down rogue routers. First, I'll cover the symptoms of router distress and the simplest, cheapest way to locate an errant one — by pinpointing device names attached to the bad router's network. In a future column, I'll discuss some advanced techniques that require a protocol analyzer such as the AG Group's EtherPeek or Neon Software's NetMinder.

Distress Signals

If all your routers are configured properly, they will agree with each other about how the internet is structured and the network will behave consistently. That is, the same zone lists will appear in the Chooser of every computer on the network, and users will experience consistent success in connecting with printers, servers, and other devices on the internet.

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TROUBLE SHOTS

What does evil look like? Router chaos takes many forms, depending on how the trouble started and how it propagates through the network. You may see zone names appearing in the Chooser that you have never seen before, or zone names may appear and disappear throughout the day. You may connect easily with a file server across the internet at noon and fail to find it an hour later. You may notice increased or unusual traffic on your backbone network (caused by routers trying in vain to resolve their differences), or you may experience unusually long delays when using network devices.

When router chaos strikes your network, your top priority is to identify which routers have good information and which routers are carrying bad information. This is an important troubleshooting task, but it can be very challenging, because of the numerous ways in which the routers can be confused and the variety of symptoms that router chaos can cause. It can be hard to distinguish among routers that were improperly configured and routers that were correctly configured but learned bad information. In either case, the cure is the same: Take the routers off-line, check their configurations, correct any mistakes, and restart them.

It's vital that you take all the misbehaving routers off-line at the same time, so that when you restart them after reconfiguration, they won't relearn the erroneous information. Usually, you'll find that you need to perform this procedure for just a small group of routers and not every single router on the internet.

Sleuthing for Names

If you do discover an unexpected zone name, such as Twilight Zone, in the Chooser, try using Apple's Inter•Poll or a similar product to get a list of devices in that zone. If you discover that one of the device names is Serling's Mail Server, for example, it may help you determine who's responsible for the problematic router, so that you can talk with the person about getting it fixed.

Next, use Inter•Poll to send a few echo packets to the mystery mail server and look at the hop count of the returning packets (for more on Inter•Poll and echo tests, see "Isolating Network Problems," April '91, page 221). The hop count tells you how many routers the packet passed through on its way back to your Mac. Compare that number with the number of routers you think it should have passed through. If the numbers differ, it suggests that someone has attached an unauthorized router to your internet. If you're operating a mixed AppleTalk Phase 1 and Phase 2 internet, for example, and the actual hop count exceeds your expected count by one, Twilight Zone may be connected to a Phase 1 router that is using one of your transition routers (routers that connect Phase 1 and Phase 2 networks) to make itself available to the rest of the internet.

Sometimes looking at the zone list won't reveal anything about a misbehaving router, because nothing unusual will show up. In these cases, the setup of the errant router is so incompatible with that of your regular routers that they can't work together at all. What happens, for example, if your Ethernet internet is configured for a network number range of 1 to 10 and someone attaches a router with a network number of 50? Chances are (depending on which configuration options are set) that this new router will be invisible to the routers already on the internet and that the zone names from that router will never appear in your Chooser.

Router chaos begins when auto-configuring routers, which don't save the tiny seed of information telling them which network they're connected to and its zone name, ask the internet for this information. Because they can choose to use the information supplied by any router on the internet, they can just as easily learn the erroneous information (supplied by the unauthorized router with a network number of 50). In this scenario, you can wind up with two completely unconnected internets on the same Ethernet wire.

Macs can experience the same network confusion as nonseed routers, because when a Mac first joins a network, it selects one router to supply it with zone information. Depending on which router your Mac picks as the supplier of its zone information, you can get one of two entirely different zone lists. One way to discover names in the mystery zone is to exploit this "feature." Using the Network control panel, you can switch back and forth between LocalTalk and Ethernet—in effect leaving and rejoining the Ethernet network—until your Mac picks the bad router (you can tell by opening the Chooser and checking the zone list). When you get the bad router, you can begin your name search with Inter•Poll.

Kurt VanderSluis is president of The Network Group, a training and consulting firm in Seattle.



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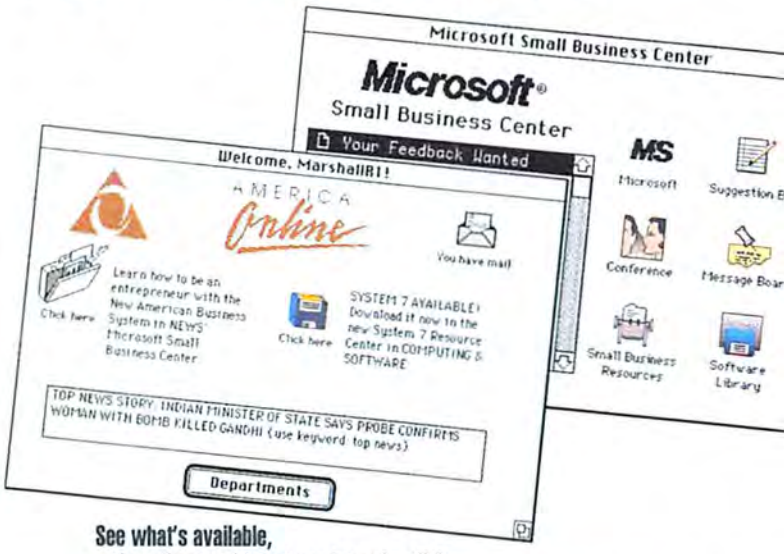
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Apple has always resisted the temptation to improve the Mac's calculator DA. Why make something simple more complex? But Calc +, from Abbott Systems, takes a fresh approach by combining an elegant interface with some real innovations, such as a "paper tape" that you can actually print. And DTPers will appreciate its built-in ability to convert picas and ciceros to inches and centimeters. (915) 747-4171. $79.

By James Bradbury



Worth a thousand words: When Caere Corp. ([408] 395-7000) introduced the Typist last year, the hand-held OCR scanner generated more enthusiasm for the concept than for its execution. This year's version, the Typist Plus Graphics, adds graphics-editing software that ought to broaden the Typist's market. The new Typist also addresses several complaints about the original (while keeping the same $695 price). One improvement left us scratching our heads, though: The original Typist could be installed only at the end of a SCSI chain — effectively tying your hands when trying to configure systems with multiple SCSI devices. The Typist Plus Graphics, in contrast, can go anywhere you like in the SCSI chain — as long as it's at the *beginning*. The more things chain, the more they stay the same

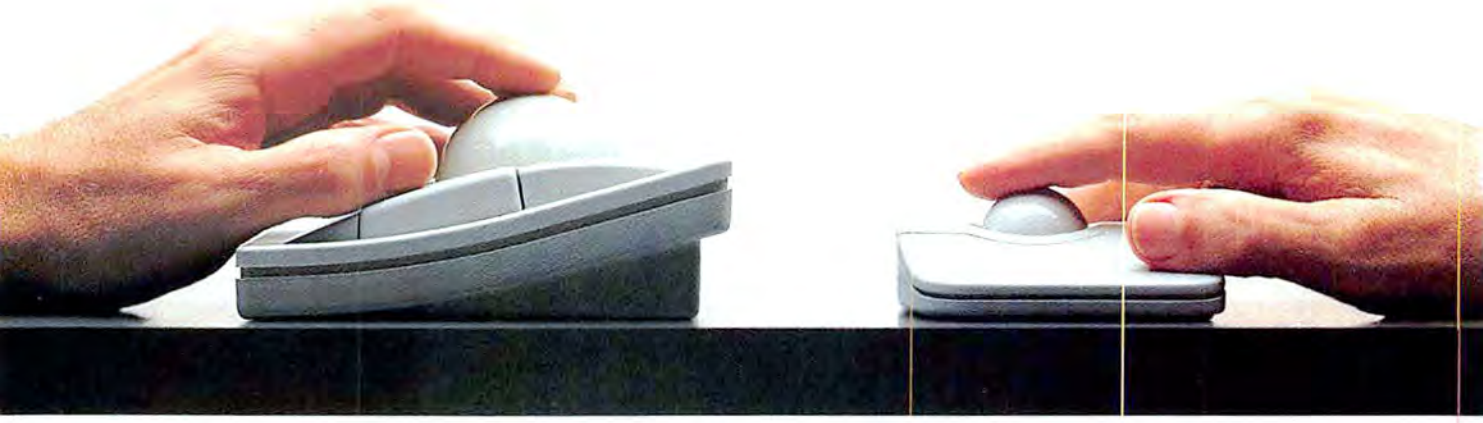
If you're suffering from "7 Oh" envy, this might be the time to check out ClickChange, from Dubl-Click ([818] 700-9525), which just shipped a 1.05 System 7-compatible update to the interface-customization utility (for more on how ClickChange works, see "Radical Cosmetology," March '91, page 231). The new version ($89.95; free to registered users) can bring System 6 users the 3-D look of System 7 without making them add any of the new operating system's more useful features — sort of like putting a phony cellular phone into your car.

Interface customization goes preppie with a computerized man Friday from Bright Star Technology ([206] 451-3697). For $59.95, At Your Service introduces an animated "actor" named Phil to your Mac. When you start your Mac, buttoned-down Phil greets you on-screen. When you get E-mail (either QuickMail or Microsoft Mail), Phil pops up politely to say so. He can even let you know if you've been working too long ("Excuse me, it's time to take a break"). A simple appointment-reminder program is also included. If (or more likely, when) you tire of the clean-cut Phil, other actors are available to registered users. You can also create your own actors, using Bright Star's interFACE program, which is available separately for $495. ➡ Equally intrusive (but a lot goofier) is the System 7-compatible version of the Talking Moose, from Baseline Publishing. For inspired and pointless lunacy, it's the closest thing to *MAD* magazine you can buy for your Mac. Now if we could only get the Moose and Phil talking to each other. (910) 682-9676. $39.95.



Just for fun: Last year's Rising Star Eddy Award winners, Robyn and Rand Miller, of Cyan, haven't been resting on their laurels. Spelunx and the Caves of Mr. Seudo is another interactive entertainment for children along the lines of Cosmic Osmo and The Manhole but with some hidden lessons in ecology, astronomy, and biology. (509) 238-6789. $49.

CoStar's new ergonomically designed trackball beats the competition hands down.

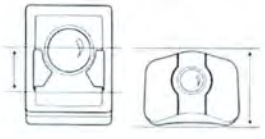


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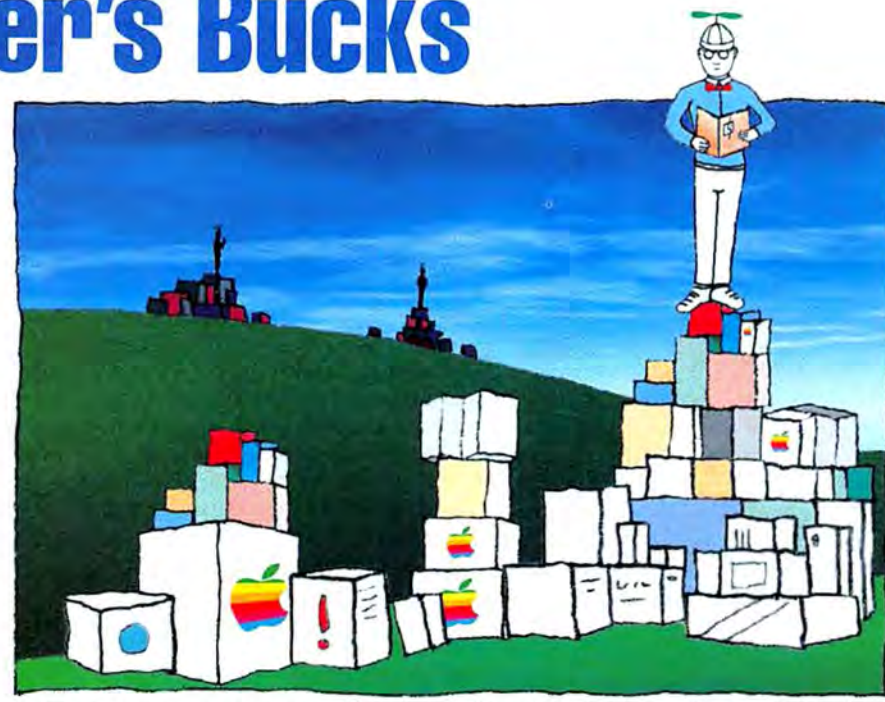
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Beginner's Bucks

When you buy your first Mac, what extras do you really need? Here's a checklist of what hardware and software you should and shouldn't bring home with you.

By Steven Bobker



All new computer owners discover a great truth shortly after they buy their hardware: The price of a computer is only a small part of the total cost of owning it. A reasonable rule of thumb for the personal-Mac user is that in the first year of ownership, you're going to spend about the same amount on software and supplies as you did on the original hardware.

Yes, you can get away with spending less, but on average you won't. The most obvious way to get away cheap is to steal software, a crime often romantically called software piracy. Software is notoriously easy to steal, and the chances of getting caught and punished are extremely low. That's too bad. If you steal your software, do me a favor: Read something else.

When you bought your Macintosh, your dealer may have tried to sell you certain software packages at tempting prices or tried to get you to buy programs you didn't really need. Rarely do dealers attempt to ascertain user needs and experience levels so they can match the software to the user. Thus, that chore — figuring out the right software to start with — becomes your No. 2 task as a buyer (selecting the hardware was No. 1; let's keep the cart behind the horse).

Many new Mac owners end up buying a copy of Microsoft Works with their new computer. Works is a low-cost, integrated package that offers word processing, spreadsheets, telecommunications, and data management. It's relatively easy to learn, and it makes a reasonable stepping stone to the greater universe of Microsoft Mac products. It's also a poor choice for getting the most out of your new computer.

Taken as a whole, Works is OK. But when you look at the modules individually, not a single one stands out in its category. On the DOS side of the personal-computer marketplace, integrated packages such as Works make a lot more sense. That's because they provide a unified interface and take better advantage of limited amounts of RAM. Those benefits don't translate to the Mac, however, because the Mac interface is already consistent from program to program; basic integration is part of the Macintosh package. You bought that when you bought your Mac. Don't pay extra to buy it again.

Also, chances are that you don't need a database, spreadsheet, or telecommunications program right away, so you're paying for things you don't need. You're better off putting the money into separate products.

So what software *do* you need immediately? A word processor. Everyone needs a word processor — even the people who think they don't. Fortunately, good word processors are cheap and getting cheaper. As far as the other main productivity applications are concerned, if you don't already know that you need them, wait until you've had a chance to figure out exactly what you want and spend the rest of your money on hardware and utility software.

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Starting on the Right Foot

Let's assume that you've decided to get an LC with that really nice new Apple 12-inch monitor. The list price for both is $3,098, but hefty discounts are readily available, so let's say you pay $2,700 for the pizza box (a nice descriptive term for the LC) and the monitor.

You should expect to spend that much more on it in the next year. You could spend even more, but there's an awful lot you can do with just that $2,700.

The first thing you should do, before you buy your first program, is pick up more memory. The LC has two empty slots just begging to be filled with more memory (other Macs have anywhere from one to four empty slots). Sure, you can run the LC just fine on the 2 megabytes it comes with, but you can do lots more with more memory — especially if you want to take advantage of the Mac's ability to run multiple applications at the same time.

There's often a gotcha in memory purchasing. Apple sells memory, and your dealer will likely install it free for you. However, even though Apple recently slashed its prices for memory almost in half, it still charges substantially more for memory than third parties do. Because installing memory is easy (especially on modular Macs such as the LC), don't be afraid to open the box and do it yourself. Yes, Apple says that even thinking about installing memory voids your warranty, but no decent dealer will see that you have extra memory and then say, "Sorry, we can't fix your blown power supply (which has nothing at all to do with memory), because it looks like you *have opened the case*."

Lots of mail-order outlets sell memory — just look in the back of this or any other Mac magazine. I'd recommend buying from a company that's been around long enough to establish a good reputation. I'll mention just a few: MacConnection's and MacWarehouse's memory prices are a bit on the high side, but both of them provide an instructional videotape to walk you through the process of installing RAM (right, I know I said it was easy, but you still want to know what you're doing). Technology Works, another excellent source, includes a well-written manual that anyone can follow.

Get as much memory as your budget allows. For an LC, you have three choices: you can add 2, 4, or 8 megabytes of memory (for a total of 4, 6, or 10 megabytes). At publication time, 2 megabytes costs between $80 and $120, 4 megabytes between $275 and $325, and 8 megabytes around $600. Just stay away from Apple memory.

When you buy a car, you get a basic tool kit with it. If you want to get the most out of it, you add some specialized tools. It's the same with a computer.

Tools of the Trade

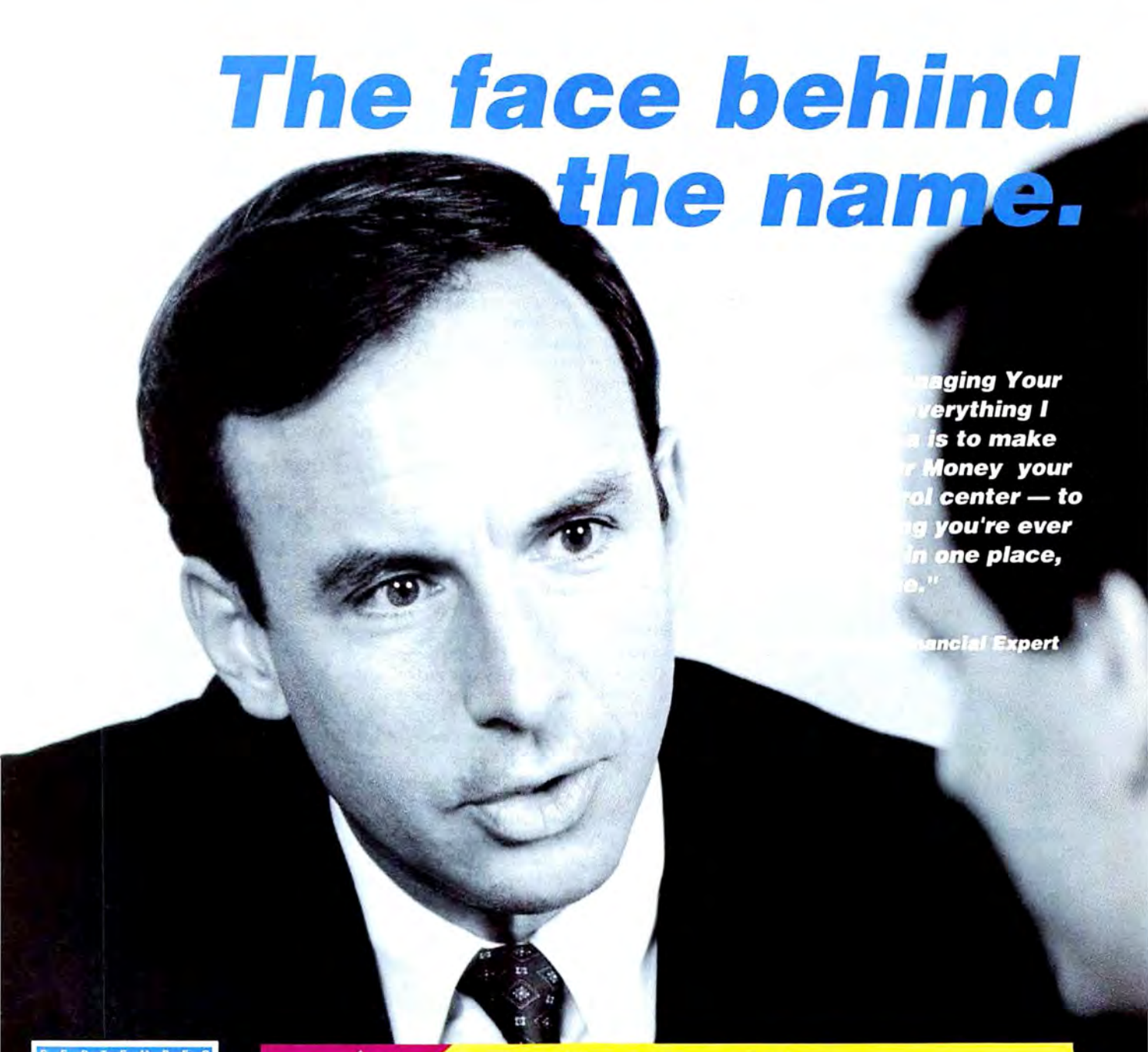
When you buy a car, you get a basic tool kit with it. If you want to get the most out of it, you add some specialized tools. It's the same with computers. Your system-software disks contain a few basic tools. Which tools you have varies, depending on your system-software version. Everyone has Disk First Aid, a diagnostic and repair program that can find and fix some damage. One handy tip when using Disk First Aid is to use it repeatedly if it fails to fix the problem on the first try. It fixes some problems in small steps. I've run it ten times in a row before getting the repair to take. So don't give up too easily. Still, there are going to be times when Disk First Aid won't be enough.

The second tool that all users automatically get with their Mac is HD Setup. This program takes care of the details involved in preparing an Apple-brand hard disk for use. You may never need to use it, as all Apple hard disks come ready to load these days and it doesn't work on third-party hard disks. But keep it in a safe place just in case.

Some of you might also get a copy of Font/DA Mover. This venerable war horse is not part of System 7 and is not needed to make the best use of fonts and DAs when you run System 7. It has never been a good tool. It's done the job but caused significant user hair loss while doing so. That it is not required by System 7 is an excellent reason to use System 7. (There are lots of other excellent reasons to use System 7; for a few good ones, check out "70 Things You Need to Know About System 7.0" June '91, page 96.)

Obviously, the tools you get from Apple with your Mac won't come close to

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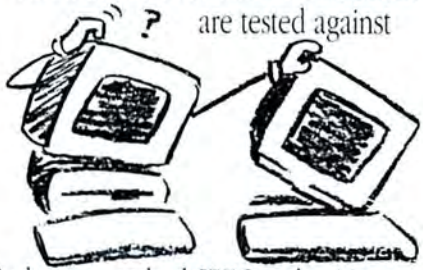
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handling every problem. So while you're at the store (or on the phone) buying the Mac, open your wallet and get some of the following extra tools. Get Suitcase II (from Fifth Generation Systems), a font and DA manipulator and enabler. It will remain useful even when you run System 7. MasterJuggler (from ALSoft), with similar functionality, doesn't yet (at press time) work with System 7. That's the main strike against it, but it's one that will be fixed.

Unless you're a DTP professional, don't bother getting Adobe Type Manager. Apple's new TrueType fonts do basically the same thing as ATM. The performance differences are insignificant to most users.

You'll need a good backup program. Backing up regularly is by far the most important computer-maintenance task. The best tools are Redux (from Microseeds); DiskFit (from SuperMac Software); and Retrospect (from Dantz Development), which is more than a backup program but does excellent backups too. If you have a backup program from a utilities collection or from another source, do yourself a favor and don't use it. Get one of the Big Three. Backups are too important to take chances with.

The hard disk you start out with might seem to be a huge amount of storage space, but you'll quickly discover that no matter how big it is, it's too small. The most obvious solution is to add more storage space, either in the form of regular hard drives or as removable-media drives (see "Portable Secure Unlimited-Storage Cartridge Drives," February '91, page 206). But there's a software solution to this problem too.

File compression is a well-developed art in personal computing. There are two basic approaches to compression. The first approach increases your permanent storage space by scrunching files not in current use, expanding them when you need to use them, and recompressing them upon closing. This should all happen as transparently as possible and with the least possible loss of time. There's only one real choice on the Mac if you want to try this sort of thing. The program is Disk Doubler (from Salient), and it's a tremendous bargain at $79.

The second approach to compression builds archives for long-term storage and for reducing the sizes of files that need to be transmitted electronically. These programs are slower and require more user intervention, however. This is an active field with some good competition. The leading contenders are StuffIt Classic and StuffIt Deluxe (from Aladdin; Classic is shareware, and Deluxe is commercial) and Compact Pro (shareware from Bill Goodman). All three are very good. StuffIt Deluxe has scads of extra features that are especially helpful for archiving and for dealing with files to be sent to or received from non-Macintosh computers.

Although the hard disk you start out with might seem to offer a huge amount of storage space, you'll quickly discover that no matter how big it is, it's too small.

You might also be tempted to get a good address-book program right away. Here's one important consideration. There are several excellent programs and two main categories. Category 1 programs (which include DynoDex, Address Book Plus, and TouchEASE) have many separate fields in each record (for instance, city, state, and postal code each have their own field). Category 2 programs (INtouch and QuickDex) have only a field or two, and data entry is quite free-form. The simplicity of Category 2 might seem tempting, but you should avoid programs in this category at first. Start with a Category 1 program. Then if you later decide to convert to a Category 2 program, you'll have no problems. The same can't be said for the reverse journey from Category 2 to Category 1. That trip can be made, but it ain't fun.

As this is being written, address managers are in a state of flux, with major updates expected for most of the programs mentioned above. You can expect to see some recommendations in *MacUser* soon, though. In the meantime, start thinking about things you can do with your Mac that are out of the ordinary — beyond word processing — and unique to you. We haven't spent the whole $2,700 yet

[All shareware programs mentioned here can be found in Zmac's Download and Tech Support libraries. — Ed.]

Steven Bobker runs Raw Fish Systems. He has been writing about Macs since 1985 and is at least as devoted as Apple is to low-end Macs and their users.

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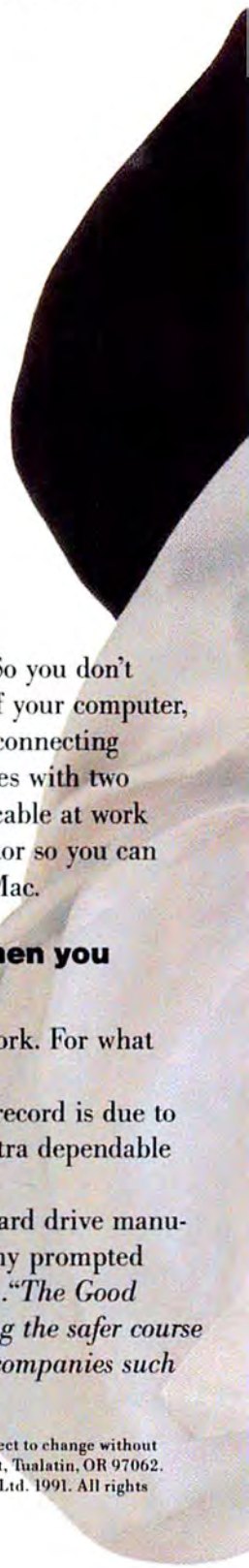
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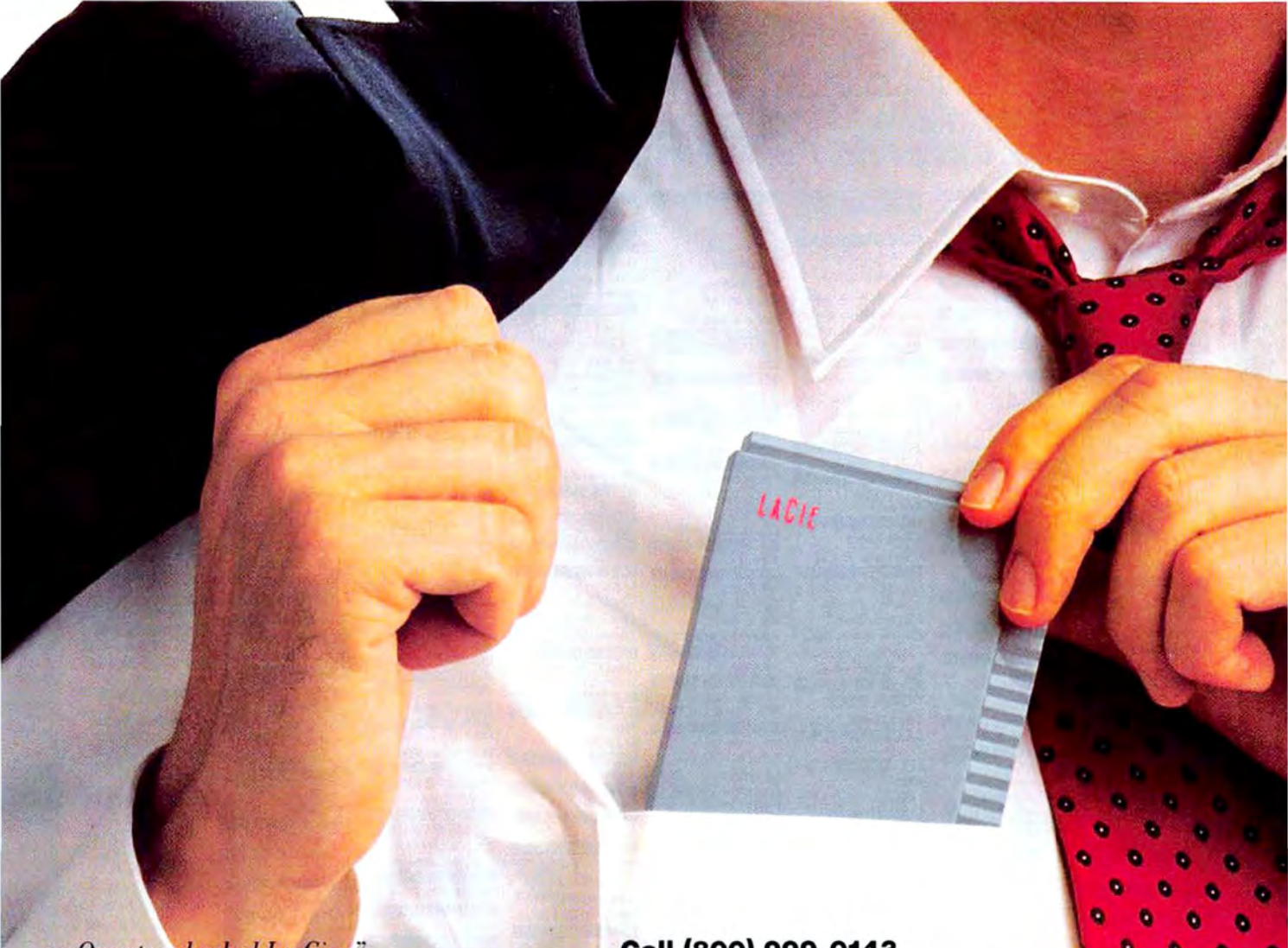
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American Unc
american unc
american unc
Antikva Margaret (VGC) $50
Antikva
Antikva Italic
Aquarius (VGC) $75
Aquarius
Aquarius 6
Aquarius 10
Arquitectura (IC) $25
Arquitectura
Augustea $50
AUGUSTEA
AUGUSTEA
ITC Avant Garde Gothic $50
Badloc (IC) $50
Badloc
Baker Signet (VGC) $25
Baker Signet
Balloon (ATF) $50
BALLOON BOLD
BALLOON EXTRA BOLD
Bamboo (ATF) $25
Bamboo
Banco $25
BANCO
ITC Barcelona $100
Barcelona Book
Barcelona Book
Barcelona Bold
Barcelona Bold
Basilea (VGC) $25
Basilea
ITC Bauhaus $100
Bauhaus Light
Bauhaus Medium
Bauhaus Bold
Bauhaus Heavy
BeeBop (IC) $25
BEEBOP
ITC Benguiat $50
Benguiat Book
Benguiat Bold
ITC Benguiat Gothic $100
Benguiat Gothic
Benguiat Gothic
Benguiat Gothic
Benguiat Gothic

ITC Berkeley Oldstyle $100
Berkeley Oldstyle Book
Berkeley Oldstyle Book
Berkeley Oldstyle
Berkeley Oldstyle
ITC Bernase Roman $25
Bernase Roman
Bernhard Tango (ATF) $25
Bernhard Tango
Bisque (VGC) $25
Bisque
Bodoni $25
Bodoni
Bodoni Italic
Bodoni Bold
Bodoni Bold Italic
Bodoni Poster
ITC Bolt Bold $25
Bolt Bold
Book Jacket (VGC) $25
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ITC Bookman $75
Broadway (VGC) $50
Broadway
Broadway Eng
Brody (ATF) $25
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Brush Script (ATF) $25
Brush Script
ITC Bustorama $75
BUSORAMA MEDIUM
BUSORAMA BOLD
Caw Modern (ATF) $25
Caw Modern
Caledonia (IC) $100
Caledonia
Caledonia Italic
Caledonia Bold
Caledonia Bold Italic
Carolus Roman $25
CAROLUS
Cartoon $25
CARTOON BOLD
Casino (IC) $25
Casino
ITC Caslon $100
Caslon Book
Caslon Book Italic
Caslon Bold
Caslon Bold Ital
Caslon Antique (ATF) $50
Caslon Antique
Caslon Antique Italic
Castle (IC) $25
Castle
ITC Century $100
Century Book
Century Book Ital
Century Bold
Century Bold Ital
ITC Century Condensed $100
Century Condensed
Century Condensed
Century Condensed
Century Condensed
Century Oldstyle $75
Century Old Style
Century Old Style
Century Old Style

Century SchoolBook (ATF) $100
Champagne (IC) $25
Champagne
ITC Cheltenham $150
Cheltenham Book
Cheltenham Book Ital
Cheltenham Bold
Cheltenham Bold
Cheltenham Outline
Cheltenham Cont
ITC Cheltenham Cond $100
Cheltenham Book Cond
Cheltenham Book Cond
Cheltenham Bold
Cheltenham Bold Ital
Chrome Bumper (IC) $25
CHROME BUMPER
Citi (IC) $50
Citi Light
Citi Bold
Claredon (IC) $50
Claredon
Claredon Book
ITC Clearface $150
Clearface Regular
Clearface Regular
Clearface Bold
Clearface Bold Italic
Clearface Outline
Clearface Contour
Comic Book (IC) $50
COMIC BOOK
COMIC BOOK TWO
Commercial Script (ATF) $25
Commercial Script
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Cooper Black
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Eras Ultra
Eras Contour
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Estro
Eurostil (IC) $50
Eurostil
Eurostil Bold
Eurostil Extended (IC) $50
Eurostil Ext
Eurostil Ext
ITC Fenice $100
Fenice Regular
Fenice Regular Italic
Fenice Bold
Fenice Bold Italic
ITC Firenze $25
Firenze
Folio (FTN) $100
Folio Light
Folio Medium
Folio Bold
Folio Extra Bold
Fraktur $25
Fraktur
Friz Quadrata (VGC) $50
Friz Quadrata
Friz Quadrata Bold
Futura (FTN) $300
Futura Light
Futura Light Oblique
Futura Book
Futura Book Oblique
Futura Medium
Futura Medium Obl
Futura Demi Bold
Futura Demi Bold
Futura Bold
Futura Bold Obl
Futura Extra
Futura Extra
Futura Condensed (FTN) $200
Futura Condensed Medium
Futura Condensed Medium Obl
Futura Condensed Demi Bold
Futura Condensed Demi Bold
Futura Condensed Bold
Futura Condensed Bold
Futura Condensed Ext
Futura Condensed Ext
Galilia $25
GALILIA
ITC Galliard $100
Galliard Roman
Galliard Roman Italic
Galliard Bold
Galliard Bold Italic
ITC Garamond $150
Garamond Light
Garamond Light
Garamond Book
Garamond Bold
Garamond Bold

ITC Garamond Condensed $150
Garamond Condensed
Garamond Condensed
Garamond Condensed
Garamond Cond
Garamond Cond
Gill Sans (Monotype) $175
Gill Sans Light
Gill Sans Light Italic
Gill Sans
Gill Sans Italic
Gill Sans Bold
Gill Sans Bold Italic
Gill Sans Ultra
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Gillies Gothic Light
Gillies Gothic Bold
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Global
Gold Rush (ATF) $25
GOLD RUSH
ITC Gorilla $25
Gorilla
Goudy (ATF) $100
Goudy
Goudy Italic
Goudy Bold
Goudy Bold Italic
Goudy Oldstyle (ATF) $50
Goudy Oldstyle
Goudy Oldstyle Italic
ITC Goudy Sans $100
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GRAPHIK
GRAPHIK SEMIBOLD
ITC Grizzly $25
Grizzly
ITC Grouch $25
Grouch
Guts (VGC) $25
Guts
Hallmarke (IC) $100
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Hallmarke Light Obl
Hallmarke Black
Hallmarke Black
Hallmarke Condensed (IC) $200
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Hallmarke Condensed Light
Hallmarke Condensed
Hallmarke Condensed
Hallmarke Condensed
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Hallmarke Condensed
Hallmarke Condensed
Hobo (ATF) $25
Hobo
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IMAGE CLUB
Industrial Press (IC) $25
INDUSTRIAL
ITC Italia $75
Italia Book
Italia Medium
Italia Bold
Ivy League (VGC) $50
IVY LEAGUE
IVY LEAGUE OPEN

ITC Kabel $150
Kabel Book
Kabel Medium
Kabel Bold
Kabel Ultra
Kabel Contour
Kaufmann Script (ATF) $50
Kaufmann Script
Kaufmann Script Bold
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Korinna Regular
Korinna Kursiv
Korinna Bold
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LSC Hairline
ITC Leawood $100
Leawood Book
Leawood Book Italic
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Leawood Bold
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Liberty
Liberty Outline
ITC LSC Condensed $50
LSC CONDENSED
LSC Condensed Italic
ITC LSC Manhattan $25
LSC MANHATTAN
ITC Lubalin Graph $250
ITC Machine $50
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MACHINE BOLD
Mier (IC) $50
MIER
ITC Mixage $50
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MICROGRAM
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Mistral $25
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Modern No. 216
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ITC Neon $25
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ITC Newtext $200
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Newtext Reg
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Newtext Demi
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Novarese Book Italic
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Uniform 46 Light
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Uniform 56 Book
Uniform 65 Bold
Uniform 66 Bold
Uniform 75 Black
Uniform 76 Black
Uniform Condensed (IC) $200
Uniform 38 Ultra Condensed Light
Uniform 39 Ultra Condensed
Uniform 47 Condensed
Uniform 48 Condensed
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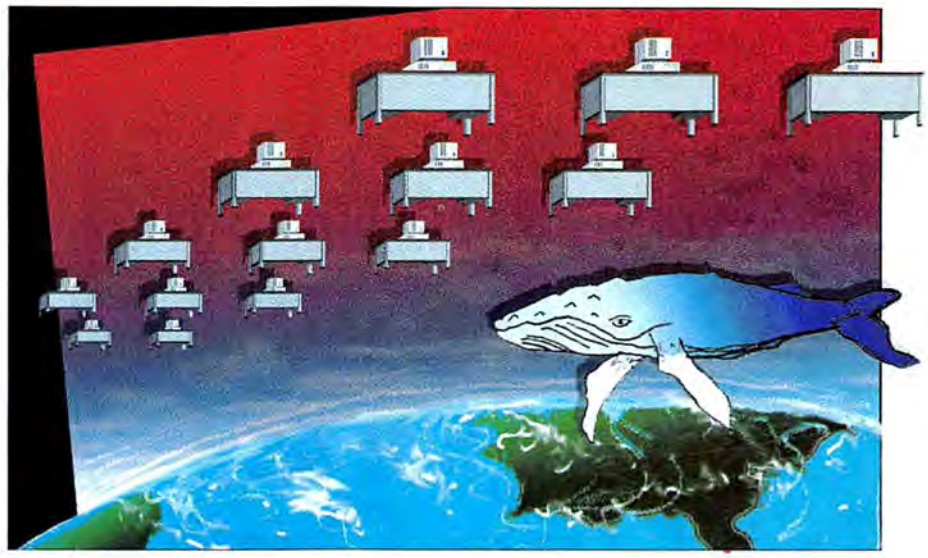
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Under-the-Desktop Publishing

Don't be blinded by delight in the magic of technology — you might find yourself at the wrong end of a desktop metaphor.

By Douglas Adams



I thought all this computer stuff was meant to save us time. One thing that Apple left out of the Mac's desktop metaphor was the pair of legs sticking out from under the desk while you're trying to find out what your computer's getting itself into a tizzy about now. Mine's been in quite a lot of tizzies lately, because I've been trying to add a lot of new stuff to it to make it run faster and better and do all sorts of sexy new things. The result is that I've become extremely well acquainted with the underside of my desk and with the magisterial chime the Mac uses to tell you that it's had enough for the moment and is going to restart itself. When it restarts, it does so with that infuriating little question-mark icon that seems to say, "Yes? What do you want me to do?" What do I want it to do? It's got a 160-meg internal hard drive, a 600-meg Qisk external hard drive, a MacPeak 140-meg external hard drive, a Rodime SyQuest removable-cartridge drive, a Relax optical drive, an Apple CD-ROM drive, and an Apple scanner — and it's asking me what I want it to do? I want it to start itself up, goddamn it, and stay started up.

Even before my Mac started to behave like this, of course, I had been exploring the floor quite a lot, attempting to address my one available serial port. This is a ridiculous problem and should have been dealt with years ago. I generally have my modem attached to my serial port, but then I got a fax modem (before you could buy combination modems). All I have to do when I want to send a fax is select the appropriate driver from the Chooser menu, click on Print, and then crawl around under my desk to change the plug in the serial port. There is, of course, a Kensington serial-port switcher attached there so that I can at least switch between two devices. Two. So if I want to use my Farallon MacRecorder, I have to dive back under the desk, meaning that any voice mail I record usually has a few expletives at the beginning that ought to be deleted. Similarly, if I want to write some music on my synthesizer, I have to connect my MIDI Time Piece to the serial port. This has led to some musical compositions that are as loud and bad-tempered as Beethoven but with fewer good tunes.

Sometimes I escape from my Mac for a day. Writers very rarely get to go out, but when they do, they like to know what they're doing. Because my diary and address book are in HyperCard, I have to download them into my Sharp Organiser. Guess what that means I have to do? Scrabble around on my knees with a plug again.

I got very excited a while back, because I saw some excellent reviews of a new digitizing tablet. It's called the Wacom tablet, and an artist friend of mine told me it's excellent because it responds to pressure — the harder you push, the thicker the line it creates. It's transformed the business of trying to draw on the Mac. I've constantly been on the lookout for something that would transform the business of drawing on the Mac, because I refuse to learn from experience. Experience tells me that however whizzo and zappy the tools you get for doing graphics on the computer, if you

basically can't draw, then whatever you do is going to look as if it's been done by someone who basically can't draw. Having graduated all the way from MacPaint to PixelPaint, MacroMind Director, and so on, I have succeeded only in making increasingly elaborate and startling messes. However, there is an ignorant and primitive part of me — much like the ignorant and primitive part of Sylvester Stallone (I'm referring here to his brain) that actually thinks that he could look like a real actor if the crew could only get the camera angle right — that still remains convinced that I could be a good artist if only I didn't have to use a mouse. (Many earlier years of hopeless thrashing about with a pencil are, of course, conveniently overlooked by this ignorant and primitive part of me, which was waiting for a computer to make this process easy.)

So, my I & P part got very excited by the idea of the Wacom digitizing tablet, and I was ready to quote some plastic over the phone to MacConnection when some uneasy sixth sense made me consult a review in greater detail to find out *how the tablet connects to the Mac*. The answer was, of course, that it connects to the Mac's serial port. Not to my serial port, it didn't. I am trying very hard to increase that portion of my life I call quality time, by which I mean time that is not spent under my desk.

I was ready for the worst when I heard about the Calere Typist. For those of you who don't know, it's a neat little handheld device that works like a vacuum cleaner for text. I read through the reviews with deep gloom. Not because it didn't sound wonderful — it did. It sounded terrific. It is a constantly available input source that sits by your elbow. If you come across a passage in a book or magazine you want to record, you simply run the Typist over it and — hey, presto — the text appears right in your document. This was the sort of thing that Arthur C. Clarke was talking about when he said that any sufficiently advanced technology would be indistinguishable from magic. A few years ago, magic is exactly what we would've thought was at work if someone had demonstrated the Typist. The reason that it filled me with the gloom, however, was that I assumed that it would have to connect to the Mac's serial port and that therefore I would not be buying one.

But no! My I & P part suddenly went whiz and zing with excitement. *Typist connected to the SCSI port!* Everything was going to be all right. I would have to move one of my hard drives out to the network somewhere, because I was fresh out of SCSI numbers, but it was worth it to get some serious magic into my system. I picked up the phone and talked plastic, and a day or two later, a satisfyingly hunky box was delivered to my door. I unpacked it. I started to install my Typist.

The reason I mentioned that it was my ignorant and primitive part that got all excited rather than my rational and sophisticated part is that my rational and

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This SCSI-chain business is rendered impenetrable by the assumption made by manufacturers that theirs is the only device you're ever going to attach to your Macintosh.

sophisticated part was raising its eyebrows rather sharply at this point. My rational and sophisticated part knows perfectly well that SCSI is a whole other basket of snakes next to which the behaviors addressed by Heisenberg's Uncertainty Principle are as predictable as rain at Wimbledon.

You will have noticed that I have rather a lot of stuff hung off my Mac's SCSI port. It didn't get there by chance, or at least it didn't get to be in its particular configuration by chance. There was an awful lot of head-banging work involved in getting it into an order that wouldn't make the Mac go "Yes? What? What is it that you want me to do exactly?" The business of getting a SCSI chain into the right order is one of the world's blacker arts and is rendered all the more impenetrable by the assumption made by many manufacturers that *theirs is the only device you are ever going to attach to your Macintosh.* Are they *mad?* Are they benighted, twisted, barking creatures who have never consulted the back pages of *MacUser?* Don't they know that others are also out there selling Mac stuff? Obviously not, or at least they choose to ignore the fact. What do they do? They put internal termination into their damn stupid machines! How do they know I don't need to put their wretched device somewhere in the middle of a chain? How do they know I'm not running a IIfx?

Excuse me, I'm getting cross — but not as cross as I'm about to get, not by a long shot. But let's get there by stages.

So setting up a SCSI chain that doesn't make your Mac go "Bing!" or "What?" involves not only crawling around under your desk but also fiddling around with screwdrivers trying to remove the internal termination from the interiors of equipment that would've made Marconi squint. You finally get them into an order in which they all work without grumbling; sulking; going "Bing!" or "What?"; or, out of sheer spite, scrambling your boot disk's directory — and then what happens?

Your Caere Typist arrives, and you try to install it. I mentioned earlier the benighted, twisted, barking creatures who put internal termination into their SCSI devices, thus consigning you to weeks of sitting under your desk like a cursing hermit, but these people appear as shining white knights of rational thought next to the blithering, cross-eyed insects who designed the Typist *with only one SCSI port!* My world reeled. I clutched helplessly at the furniture, hyperventilating.

Of course it didn't work, stuck at the end of the SCSI chain. Nor, for that matter, did anything else while the Typist was stuck there. Then its INITs wouldn't init properly. I phoned to ask for advice on this and was told the obvious: Try every possible combination of SCSI devices against every possible combination of INITs in logical order, and see if any of them work. A quick calculation told me that this procedure would be unlikely to be finished before the most optimistic estimates of when we may expect the heat death of the universe and that it would certainly be quicker simply to hire someone to type everything out for you. I mean everything — the Library of Congress, the Bodleian Library, everything.

I spent one weekend getting everything to work, and for one brief flickering moment on Sunday afternoon, it did. But it's rather like building a 12-story house of cards: It's a neat trick if you can do it, but you wouldn't want to live in the thing. Someone banged a door elsewhere in the house and the SCSI chain went "Bing!" and "What?" again and stayed like that until I removed the Typist altogether.

So now it works quite well as a very smart and elegant — if rather expensive — paperweight. It holds down great stacks of paper quite effortlessly while I type in their contents myself. I wouldn't mind so much, except for one thing: I have acquired a wonderful NuBus card called a Quadra-Link. It gives me four extra software-switchable serial ports. Four! And if that's not enough, you can put in another card and get another four. It is absolutely wonderful and is responsible for a nicely deepening layer of dust on the floor under my desk, which I have not had to visit for weeks. What bothers me is that I could have bought myself a Wacom tablet after all. It costs about the same as my smart new black-and-red paperweight.

In his spare time, when not coping with SCSI chains, Douglas Adams writes international best-sellers.



Test It Yourself — Hard-Disk Drives

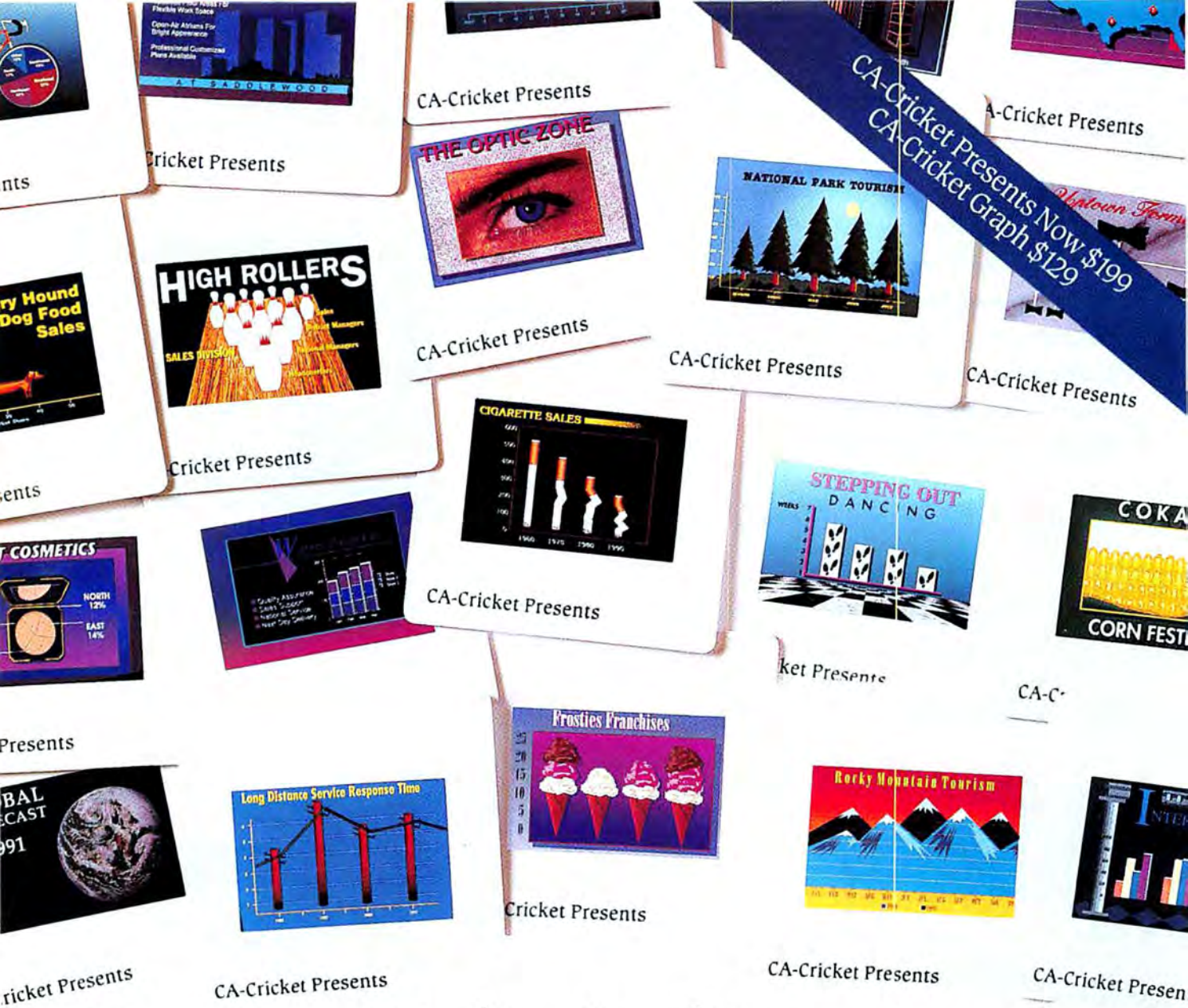
Have you ever wanted to conduct your own hard-drive lab? You can download the tools that MacUser Labs uses to test hard-disk drives from Zmac's Download & Support Forum. *MacUser*'s hard-disk benchmark, DiskBasher, was programmed by our own Stephan Somogyi. It's in Library 1 (Applications); BASHER.SIT is the filename. If you're having problems with your disk, check out Generic Hard Disk Tips. It's available in Library 7 (Reference), and the filename is GENTIP.SIT.

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- If you're not a CIS subscriber, you can sign up for Zmac by following these directions:

1. Call (800) 635-6225 (voice) to find your local access number.
2. Set up your modem and telecommunications software with the following standard Mac settings: 8 bits, one stop, and no parity.
3. Dial your local access number. When connected, press Return. You'll see the following prompts on-screen. Your responses are printed in boldface type.
Host Name: **CIS**
User ID: **177000,5200**
Password: **Z*MAC**
Agreement Number: **Z12D9014**
4. You will then be prompted for additional information, including a credit-card number for billing purposes. If you cannot bill to a credit card, call the CompuServe customer-support line listed below. Sign-up is free, but normal access time is billed at $12.50 per hour.
5. Call CIS again with your user ID and password. A new password will arrive in the mail within ten days.
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How to Buy Monitors

So you've just upgraded from a Mac Plus to an LC. You've got a computer with more power, more storage, and a sleek design, but there's still something missing — a monitor. If you're used to the built-in 9-inch display that's part of the Plus, SE, and Classic, the array of monitors available can be both enticing and intimidating. Here's a quick guide to the fundamentals of shopping for the right monitor (for tips on test-driving a monitor at a dealer, see "Do-It-Yourself Screen Tests," February '91, page 198).

By Victoria von Biel

✔ Monitors are available with screen sizes of 12 to 21 inches. As with TVs, the screen size is measured along the diagonal.

✔ Although some monitors are compatible with the built-in video port of the Mac IIci, IIsi, and LC and you can plug them straight in to your Mac, in most cases you need to buy a monitor/video-card package (called a display system) that's compatible with your Mac model.

✔ Depending on the monitor's resolution, a 12-inch monitor shows about half of an 8-x-11-inch page, a full-page display (15 inches) shows the whole page, and a two-page display (21 inches) shows most of two pages side by side.

✔ Wide displays are good for such applications as spreadsheet and page-layout programs or if you like to work with several applications open simultaneously.

❗ If you're using your Mac for desktop design and need a direct correlation between the size of objects on the screen and their size when printed, look for a monitor with a resolution of 72 dpi (dots [pixels] per inch). Apple's screen-resolution standard is based on 72 dots per inch, and monitors that have 72 dpi are known as WYSIWYG monitors. On a monitor with higher resolution, objects appear smaller and more of the page fits onto the screen, but text may be harder to read.

$ If you do little more than word processing, go for a monochrome (black-and-white) or gray-scale monitor. They're cheaper and sharper than color monitors.

✔ Buy a color monitor if you're using your Mac for graphic design or presentations. If your Mac supports it, buy a 24-bit-color board. You'll get millions of smooth colors (8-bit color tends to "band"), and when you want to speed things up, you can use the Monitors control panel or an Fkey (such as the shareware Switcheroo) to switch the color mode to 8-bit.

? When buying a monitor, ask to see several brands at once, so you can compare their performance. To avoid interference from magnetic fields (which can cause screen jittering), don't place the monitors too close together.

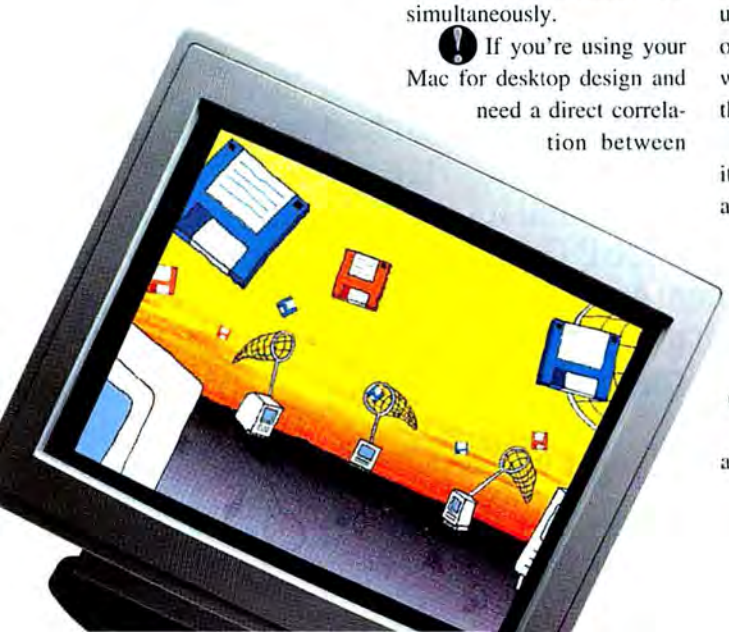
✔ A good monitor has accurate screen geometry — circles are round, not oval, and squares have straight, even sides. There may be distortion at the edges of the screen, because the electron beam that creates the screen image has to travel farthest to get to the edges of the screen, but the distortion should be minor. Larry Pina's shareware program Test Pattern Generator (available from user groups and on-line services such as Zmac) lets you easily test a monitor's screen geometry.

✔ To avoid eyestrain, look for a monitor with sharp focus. Focus is most apparent with small font sizes and thin lines.

❗ Some monitors have etched screens to cut down on glare, but it shouldn't be at the expense of sharp focus. You can also reduce glare with antiglare screens from manufacturers such as NoRad, Kensington, and Curtis.

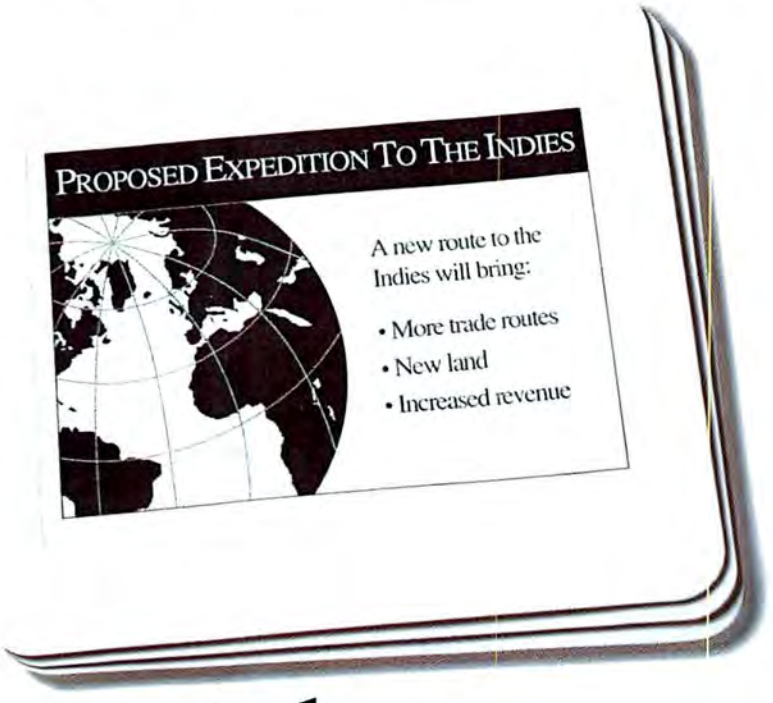
❗ To avoid screen flicker, opt for a monitor with a vertical refresh rate of more than 60 hertz. If your eyes are sensitive to fluorescent lights, choose the highest possible refresh rate.

✔ Your Macintosh can work with more than one monitor at a time, even if you have a Plus, Classic, or SE — the SE/30 accommodates an added color monitor as well. You need to install a video card for each additional monitor, though.





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Ever fed a laser printer manually, only to discover someone else's memo printing out on your envelope? Scope out the printer traffic with Blue Parrot ($149), a control panel from Casa Blanca Works ([415] 461-2227) that gives you a list of who's printing what for each printer in your network zone.

By John Rizzo



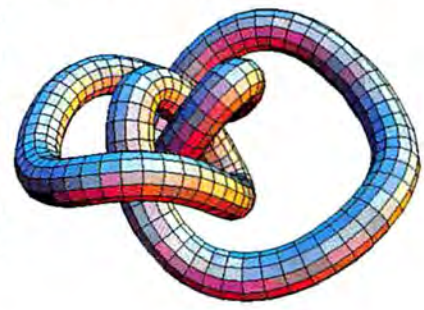
Beyond System 7: You can customize the new system software at little or no cost with some of the utilities available from on-line services. One of the best is Helium, a freeware INIT that lets you turn balloon help on and off on the fly by holding down certain keys. And if you have software that doesn't yet run on System 7, why not use both System 6 *and* System 7? System Switcher and System Picker are nearly identical programs that let you switch between the two versions. Or for those who are merely nostalgic for the way System 6 did things, JustClick lets you cycle through applications by clicking on the Application menu and Trash Chute empties the trash when you shut down your Mac. Find these and other INITs on *MacUser*'s on-line service, Zmac (part of CompuServe), as well as on other on-line services.

CD-ROM heaven: If you're a CD-ROM fanatic, you know only too well that many more CDs are available for PCs than for Macs. Thanks to Insignia's SoftPC 2.5, you can now run *any* DOS CD-ROM on your Mac, even those finicky discs from Microsoft. SoftPC is a DOS emulator that runs on Macs and on about 20 UNIX machines. And if you think DOS on UNIX is weird, SoftPC can also run Windows 3.0 on your Macintosh. (800) 848-7677. $199 to $499, depending on configuration.



Power up: Don't let the Mac LC's 4-watt power limit for add-in cards prevent you from adding the hardware you need. LC Power, a replacement power supply from Applied Engineering, gives you 15 watts for expansion cards — enough for power-hungry accelerators. Installing LC Power is a simple matter of popping out your LC's standard power supply and popping in the new one. (214) 241-6060. $159.

Programming news: Some programs let you graph math functions so you can *see* how they differ, but only Wolfram's Mathematica lets you *hear* the differences. That's because version 2.0 of the mathematical programming language supports sound, among other new features. Another of those new features is that Mathematica now runs in a client/server configuration on 20 platforms. (217) 398-0700. $595. * ObjectMaker, from Mark V Systems, is a CASE tool that lets you model and analyze your software designs as well as produce some programming code. You can even use a variety of languages — the program's object-oriented-language modules can generate code in Ada, Smalltalk, C++, and C. (818) 995-7671.



Powering Up MacDraw Pro

It took two years for MacDraw Pro to leave Claris' drawing board, but it shouldn't take you that long to learn how to get the most out of the new program. Here are eight tips to get you started.

By Shelley Zulman

MacDraw Pro has plenty of new features — millions of colors, gradient capability, and better file-importing options and greater control over text than in previous versions of MacDraw — but you may still be left with a lot of questions. How do you split objects? How do you edit many colors in an image at once or control letterspacing in text? Here are some tips for getting the most out of MacDraw Pro:

1. **Installing MacDraw Pro.** If you have MacWrite II, Claris CAD, FileMaker Pro, or an earlier version of MacDraw already installed, check to see if you have the Claris XTND System document in your System Folder. If so, throw it out before running the MacDraw Pro installer, which will automatically install the XTND document in the Claris Folder in the System Folder. If you have more than one XTND document installed, you'll have difficulty opening MacDraw Pro. (Claris XTND is the technology that lets you import and export graphics and text files.)

2. **Speeding up functions.** If performance is sluggish, go to the Apple menu and check your memory allocation in the About MacDraw Pro box. If the box says "Available colors are currently limited by memory," here are some ways to increase available memory and speed:

•Use fewer colors.

•Decrease the size of document windows onscreen.

•Increase the memory allocation for MultiFinder or System 7 by selecting the MacDraw Pro icon in the Finder and choosing Get Info from the File menu (Command-I). Type a slightly larger amount of memory in place of the amount presently allocated.

•If you're using gradients, turn on "Fast display of Gradients" in the Preferences dialog box, which you access via the Layout menu (gradients will appear banded rather than dithered). You can toggle this option on and off with Command-Option-G.

•Turn off "Kerning by pairs" in the Preferences dialog box.

•Use the Layers feature to structure complex documents. Hiding layers lessens the time the Mac takes to redraw the screen.

•If you're using System 7 with a 68030-based Mac, turn on virtual memory. If not, close applications and documents you're not using.

3. **Keyboard shortcuts.** If you hold down the Command key in a dialog box for a moment, you will see keyboard command equivalents for dialog-box items. For additional drawing shortcuts, turn on "Typing activates shortcuts" (Command-Option-S) in the Preferences dialog box. You can then select tools by using the keyboard (R for rectangle, T for text, and so on).

4. **Controlling letterspacing.** If you're working with text, you can control letterspacing (kerning) automatically or manually. To adjust letterspacing automatically, turn on "Kerning by pairs" in the Preferences dialog box.

To control letterspacing manually, make sure that this option is turned off. Select a range of characters by using the text tool, and hold down the Option key while pressing one of the arrow keys. The left arrow moves the characters closer together, the right arrow moves them apart, and the up arrow returns the letters to their default spacing. Adjust letterspacing throughout a large block of text by selecting it, holding down the Option key, and pressing the appropriate arrow key.

5. **Splitting an object into sections.** Although MacDraw Pro doesn't include a tool for splitting objects in two, you can use copying and pasting to cut an object into two or more parts. Say, for example, you've drawn a map and want to split it into regions. Here's how you do it:

Select the object, and choose Reshape (Command-R) from the Edit menu. This shows all the reshaping handles along the object's sides (see Figure 1). Click at the point where you want to split the object, adding a new handle. Select the handles of the part of the object you want to cut off — including the point you just added — by Shift-clicking. Copy the handles to the Clipboard. Deselect (Shift-click) the new handle you created, but make sure the other handles are still selected. Use the Delete key to get rid of the remaining selected handles (make sure you don't cut them by using Command-X, though, because you'll just copy them over the Clipboard's contents). Click away from the object, and paste in the contents of the Clipboard. You now have an object split into two sections.

6. **Adjusting colors in an imported image.** If your Mac is capable of only 8-bit color, imported images that were created in 24-bit color won't look as good as they could. To get around this, select the image, bring up the Color Editor from the Layout menu, and choose Image Colors from the color palette's Special menu. This creates a new palette from the colors in the image. The

image will then map to its own palette and look much better on-screen.

7. Creating custom color blends. By using the Blend feature in the Color Editor, you can create custom colors within a selected range (for example, a series of orange shades that range from deep red to pale yellow). To do this, first choose Colors from the Layout menu. Unlock the padlock icon on the top right corner of the Color Editor, and click on the flag icon in the lower right corner (this brings up editing options such as Blend and Warmer).

To create a linear blend of colors, drag the color from which you want the blend to start to the bottom of the palette. Next drag the color to which you want to blend, and place it next to the starting color. Figure out how many intermediate shades you want between the starting and ending colors, and then Shift-click to select that number of cells in the palette (you can use any colors — they're just being used as placeholders). Drag these shades down to the bottom of the palette, and place them on top of the ending color (this forces the ending color to the end of the range). Select the entire range, and click on Blend. You now have a series of colors ranging in color from the starting-color cell to the ending-color cell (see Figure 2).

8. Using gradients for special effects. You can use gradients to create special effects such as background texture or a 3-D look. The Gradient Editor (which you access via the Layout menu) lets you add color to a gradient as well as change its angle and focus. Here's how to generate a gradient that gives objects a silver-metallic look (see Figure 3).

With the Gradient Editor selected, choose View by Name in both the Claris Colors and the Gradients palettes. In the Gradients palette, choose one of the diagonal gradients (such as 45° directional) and choose New Gradient from the palette's Edit menu. Give the gradient a name in the Gradient Editor dialog box, select the first of the four Colors boxes, and click on 60% black in the Claris Colors palette. In the second and fourth Colors boxes, place 10% black. Place 60% black in the third Colors box. You can create a gold-metallic look in similar fashion, by assigning shades of orange/yellow to the gradient.

MacUser **Intern Shelley Zulman is a senior at Yale University. Steve Pollack, product manager for MacDraw Pro, and Karl Tate, of Associated Press Graphics, contributed to this article.**

Figure 1: Splitting an Object into Sections

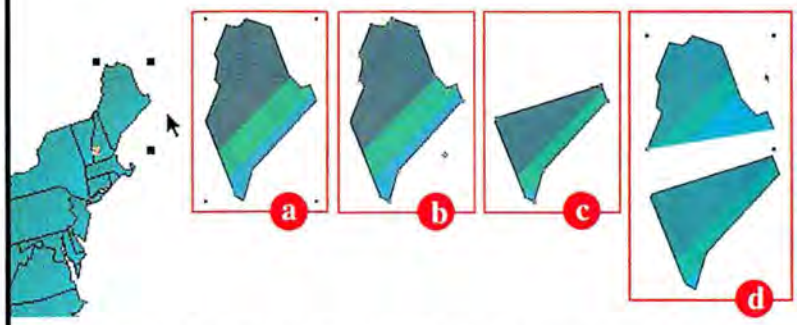


Figure 1: Although MacDraw Pro doesn't include a tool for splitting objects in two, you can use cutting and pasting to split an object (in this case, the state of Maine [a]) into two or more parts. Select the handles in the section of the object that you want to cut (b), and copy those handles to the Clipboard; delete the selected handles on the original object (c); and finally, paste in the Clipboard's contents (d).

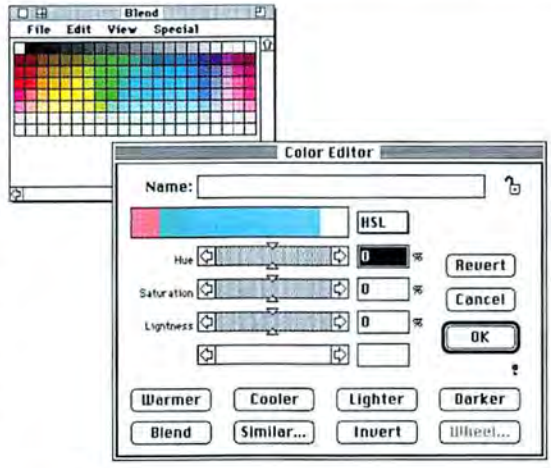


Figure 2: By using the Color Editor's Blend function, you can quickly create a range of closely related colors. In the example here, vivid orange is blended to pale orange in a series of six shades to create a palette of desert tones.

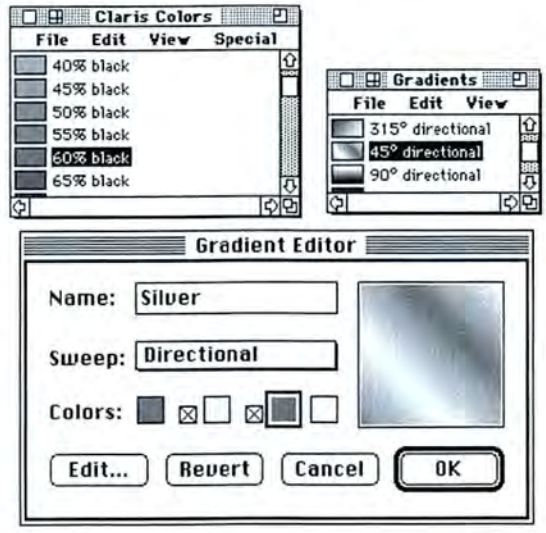


Figure 3: The Gradient Editor lets you create several special effects. Here, a silver-metallic effect results from adding different shades of black to a 45° directional gradient.

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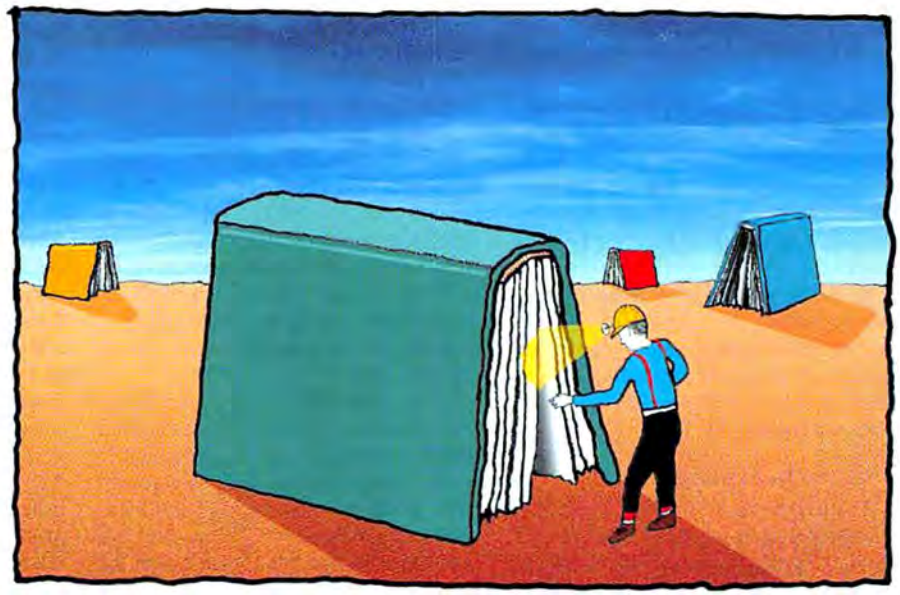
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Read All About It

Riding on System 7's coattails comes a bunch of books on the new system software. Need to know which one is right for you? Read on

By Bob LeVitus



In recent weeks, no fewer than four books with the words *System 7* in their title have crossed my desk, and several others will be released soon. It's not instantly obvious how they fit into the grand scheme of things. If you've already bought Apple's $99 Personal Upgrade Kit — which includes *five* manuals — do you need to buy one of these new books too? Or can you skip the upgrade kit, get the system software elsewhere, and buy one of the books for reference and troubleshooting?

There's really no right answer to this question. If you're a beginner, you're probably best off buying the upgrade kit and one — or even two — System 7 books. Intermediate users can go either way — get the disks from their local MUG (Macintosh user group) and buy one of these books, or spring for the upgrade kit. Power users, especially those who don't think they'll need tech support (90 days of free tech support is included with the upgrade kit), can probably do without the Apple kit but may want to check out the books available.

Getting into the System

But before I tell you about the books, I want to talk a little about where you get your copy of the system software, because no book on System 7, no matter how wonderful, will be any use at all if you're still running System 6. If you *don't* buy Apple's upgrade kit, the cheapest way to get the system software is through a user group. Of course, you *can* download it from CompuServe or America Online, but it takes several hours and the online time alone will almost certainly cost more than the $20 to $30 that user groups are charging. Theoretically, your dealer is authorized by Apple to let you copy the System 7 disks, but in my experience, few dealers are this obliging.

Now for my user-group plug: A good Mac user group is indispensable. If you're not a member of one, you should be. A MUG is a great place to get questions answered or to acquire public-domain and shareware software. Call Apple at (800) 538-9696, ext. 500, for a list of groups in your area.

Depending on your local MUG's policies, you may be able to order System 7 disks by phone. For example, my user group, BMUG, offers a System 7 package you can order by phone. For $55, you get the system software, Kay Yarborough Nelson's *The Little System 7 Book* (Berkeley, California: Peachpit Press, 1991), and a one-year membership that includes two issues of BMUG's always awesome 400-page newsletter. You can reach BMUG at (415) 549-2684.

But even though this is a great deal and I think MUGs are wonderful, seriously consider going down to your dealer and buying the upgrade kit anyway, no matter how much you know (or think you know) about System 7. It's one of Apple's best-executed products in a long time, and it's packed with useful stuff. What makes it worth more than twice what the disks cost elsewhere? Aside from the

unusually well-written (at least for Apple) manuals, you get a copy of HyperCard 2.1 and the aforementioned toll-free technical support. You won't get HyperCard 2.1 if you download the software from an online service (although most user groups can distribute it), and you certainly won't get technical support.

The support is the big difference, and it's hot. I've called several times, with problems both real and made-up, and have been pleasantly surprised by the quality of the service. I knew Apple was providing support; I just didn't expect it to be *good* support.

So there you have it — my reasons for recommending the upgrade kit. Unless you're a major power user or your budget is unusually tight, buy the upgrade kit first. Then, after you've digested it, it's time to go buy a book.

At the Bookstore

The four books I've looked at are Kay Yarborough Nelson's *The Little System 7 Book*, Charles Rubin's *The Macintosh Bible Guide to System 7* (Berkeley, California: Goldstein & Blair, 1991), Lon Poole's *The Macworld Guide to System 7* (San Mateo, California: IDG Books, 1991), and Craig Danuloff's *The System 7 Book* (Chapel Hill, North Carolina: Ventana Press, 1991). Because all the titles are similar, I'll refer to them by author name to avoid confusion.

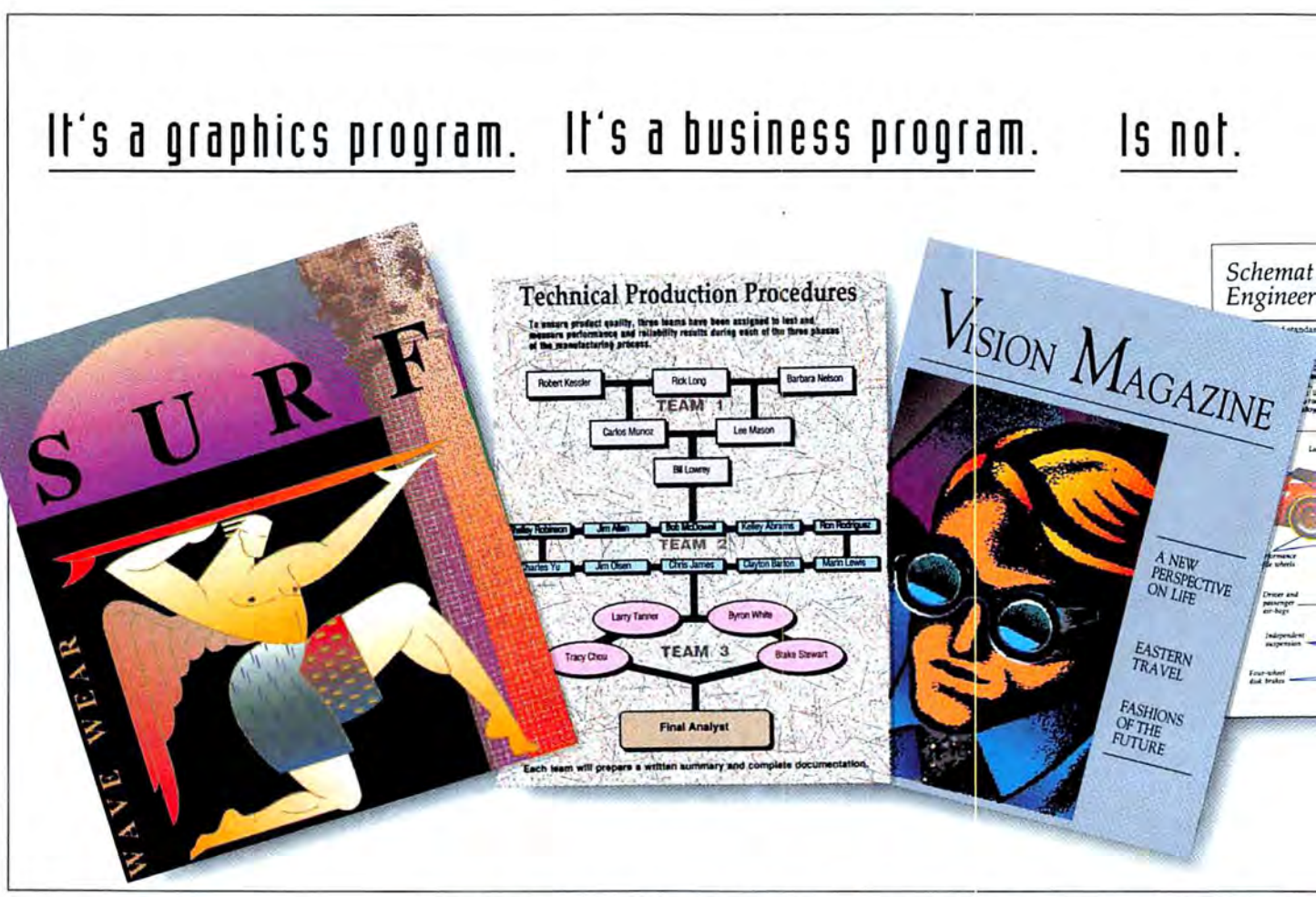
(By the way, there's a fifth System 7 book — *System 7 Revealed* by Anthony Meadows [Reading, Massachusetts: Addison-Wesley, 1991] — that looks at developing System 7-friendly applications. Because it's not a troubleshooting handbook for System 7 users, I haven't included it here, but if you're a developer — or interested in becoming one — definitely check it out.)

First things first. In the interests of columnist ethics, I must disclose that I am quoted on the back of Craig Danuloff's book, saying, "*The System 7 Book* is a must-have. Even the most experienced users will learn a thing or two." That statement is absolutely true, but I hadn't seen the other three books when I said it. In retrospect, the same could have been said for all the books — I learned something new from each one.

Which is to say that there isn't a bad one in the bunch. Although each has a slightly different look and feel and is aimed at a slightly different audience, they all contain just about everything you need to know to get going with System 7.

One problem almost all these books share is that — with the exception of Lon Poole's — they were released last May, when System 7 finally came out (Poole's came out in July). That means that the authors did most of the writing and screen dumps with beta versions of System 7 — and it shows. All the books contain errors of fact and, in some cases, inaccurate illustrations.

Fortunately, the errors are usually minor; you probably won't notice most of them. And even more fortunately, the publishers are making corrections in subsequent printings. By the time you read this, second or third printings (look on the



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copyright page), with corrections, may be available. If you're concerned, order directly from the publisher and insist on the most recent printing. Also, if you buy Danuloff's or Poole's book and send in the registration card, you'll receive two free newsletter updates that will tell you of any errors in early printings.

The Little System 7 Book. At $12.95, this book is a bargain, and like all books from Peachpit Press, it's good to look at. Kay Nelson has a delightful style — witty and lighthearted yet not overly fluffy. If you're a newcomer to the Mac, this is the book for you. There's just enough hand-holding to keep beginners from getting lost but not so much that experienced users will lose interest. That said, this is also a great little book for more-advanced users. Steve Costa, executive director of BMUG, obviously agrees. In a sticker on the cover, he proclaims: "I've read all the available System 7 books, and this is definitely the best in terms of what most people are going to need."

Although this book is the smallest of the

The System 7 File: Aliases with Style

The default font style for an alias is italic — pretty boring, not to mention hard on the eyes. To add a little style to your aliases, *MacUser*'s alias specialist Bill Monk, of Birmingham, Alabama, has developed a utility that adds a default font style, such as bold, underline, or italic, to all your aliases. Called Alias Stylist, it also has a "Not So Stylish" option for adding outline, shadow, condensed, and extended styles. Adding all seven options makes for one ugly default, but at least you can easily distinguish between what's real and what's an alias. (If you'd rather not know whether a file is an alias, just turn off all options and alias names will appear in the type style you've selected for your system.)

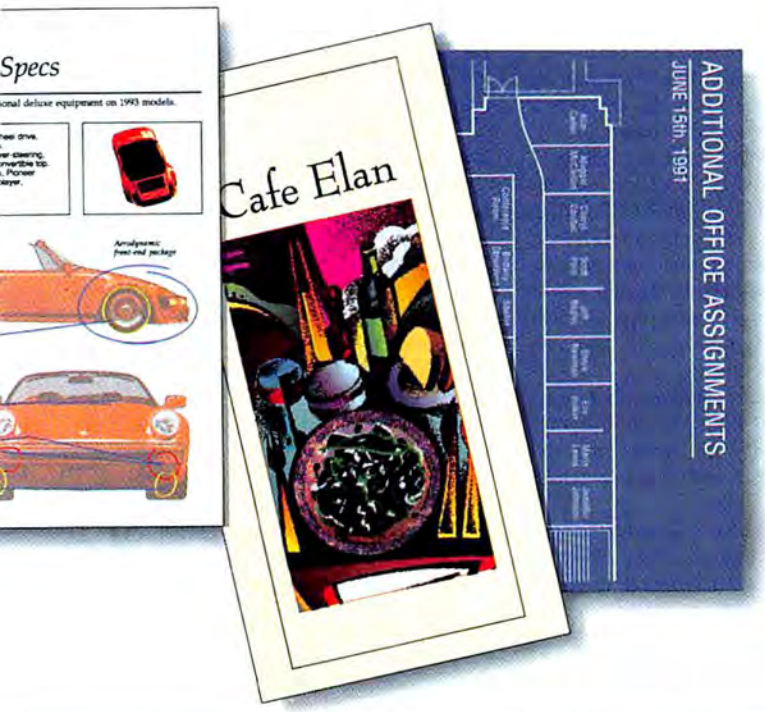
Alias Stylist is available exclusively through Zmac, *MacUser*'s on-line service. Look for ALISTY.SIT in Library 3 (Utilities) of the MacUser Forum. And while you're at it, check out *MacUser*'s other alias utilities, Alias Assassin (ALIASA.SIT) and Nom de Plume (PLUME.SIT).

Now on to this month's tip, which comes from Peter Crownfield (via Zmac). Peter says he keeps an alias of the Startup Items folder on his desktop to make it easier to add or remove items. But, he says, there are occasions when he wants to start up without waiting for the applications and documents in the Startup Items folder to launch.

Happily, Peter discovered that holding down the Shift key during startup not only bypasses System extensions but also bypasses items in the Startup Items folder. If you want your extensions to load but not the files in the Startup Items folder, wait until all your extensions have loaded and you see the "Welcome to Macintosh" message and *then* press the Shift key. Continue holding down the Shift key until the desktop appears.

Submit your favorite System 7 tips either by mail or by modem in Zmac's System 7 Forum (please include your address as well). If you submit the month's best tip, you'll not only receive notoriety and fame but you'll also get a spiffy (and rare!) "I Beat the System" T-shirt.

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POWER TOOLS

BEATING THE SYSTEM

bunch, it packs a lot of information into its 150 pages. It's well organized, sports an inviting layout with lots of illustrations, and ends with a wonderful troubleshooting section. Pithy and helpful tips appear in the margins.

This book's only flaw, if you can call it that, is that the topics are covered in the fewest words possible. If all you want is the essentials, this is the book for you; if you're looking for lengthier explanations, instructions, and tutorials, you'll probably be happier with Danuloff's or Poole's book.

The Macintosh Bible Guide to System 7. Charles Rubin's $12 book is very succinct: It reminded me of Joe Friday in "Dragnet": "Just the facts, ma'am." Still, it's relatively complete and, like all these books, contains just about everything you need to know.

Rubin assumes that readers know quite a lot — there's less hand-holding than in Nelson's book and more raw facts. If you're brand-new to the Mac, this isn't the best choice for you; if you're a power user looking for the most information in the fewest pages, it probably is.

One quibble: This is the only book typeset on a laser printer. All the other books were produced with a high-resolution imagesetter, and it makes a big difference. This book is ugly compared with the others — the pictures aren't as crisp, and some of the type and hairlines look washed out. I find it irritating and amateurish.

But let's not judge this book by its pages: On the whole it's clear, easy to understand, and the least expensive of the bunch. *And* it comes with a 30-day money-back guarantee. Still, this book was my least favorite — probably because it wasn't as attractive as the others.

The Macworld Guide to System 7. This $24.95 reference book was written by Lon Poole, *Macworld*'s How To/Quick Tips columnist, and it's chock full of lucid explanations and undocumented tips. Poole writes as though he's chatting with a friend, yet every paragraph is clear, concise, and very informative. The illustrations are first-rate too.

This is the most complete book of the bunch (Danuloff's *The System 7 Book* is a close second). It's big, well organized, and easy to look at, and it includes a truly comprehensive index.

Although this book's layout is the busiest, the guide is easy to follow. The margins contain icons that denote comparisons (between earlier system-software versions and System 7), warnings, quick tips, and undocumented features. Although the pages sometimes seem crowded, the format works well.

This book includes a couple of bonuses: a decent tear-out quick-reference card that puts information on file sharing, publishing and subscribing, Finder shortcuts, and directory dialog boxes — plus the free updates mentioned above — conveniently at your fingertips.

The System 7 Book. Craig Danuloff's $22.95 guide is both witty and wise. His explanations are crystal clear, and the book is well organized; it's obvious this guy knows a lot about the Mac (he also wrote *Encyclopedia Macintosh* [Alameda, California: Sybex, 1990]). The book has a decent amount of hand-holding but never enough to be bothersome. The sections on file sharing and networks are particularly good, especially for network novices.

Beyond the basics, Danuloff provides tons of tips, techniques, and hints. And like the others, this book has no shortage of helpful graphics. It also includes two free updates.

Danuloff adds another nice twist: For $39.95, you can order a two-disk companion set with six commercial TrueType fonts licensed from Bitstream, Letraset, and Linotype (a $200 value) plus public-domain and shareware utilities and fonts. Note, however, that the coupon for this great deal doesn't appear in the book's first printing.

The Bottom Line

For power users, I recommend Rubin's *The Macintosh Bible Guide to System 7* — it's the least expensive, and it tells you everything you need to know without mincing words. Danuloff's *The System 7 Book* and Poole's *The Macworld Guide to System 7* take longer to read, but they're both chock-full of good advice and useful techniques.

For intermediate users, I recommend Nelson's *The Little System 7 Book* — it's inexpensive and has a cheerful, nonthreatening tone — or Poole's and Danuloff's books, which cover significantly more material.

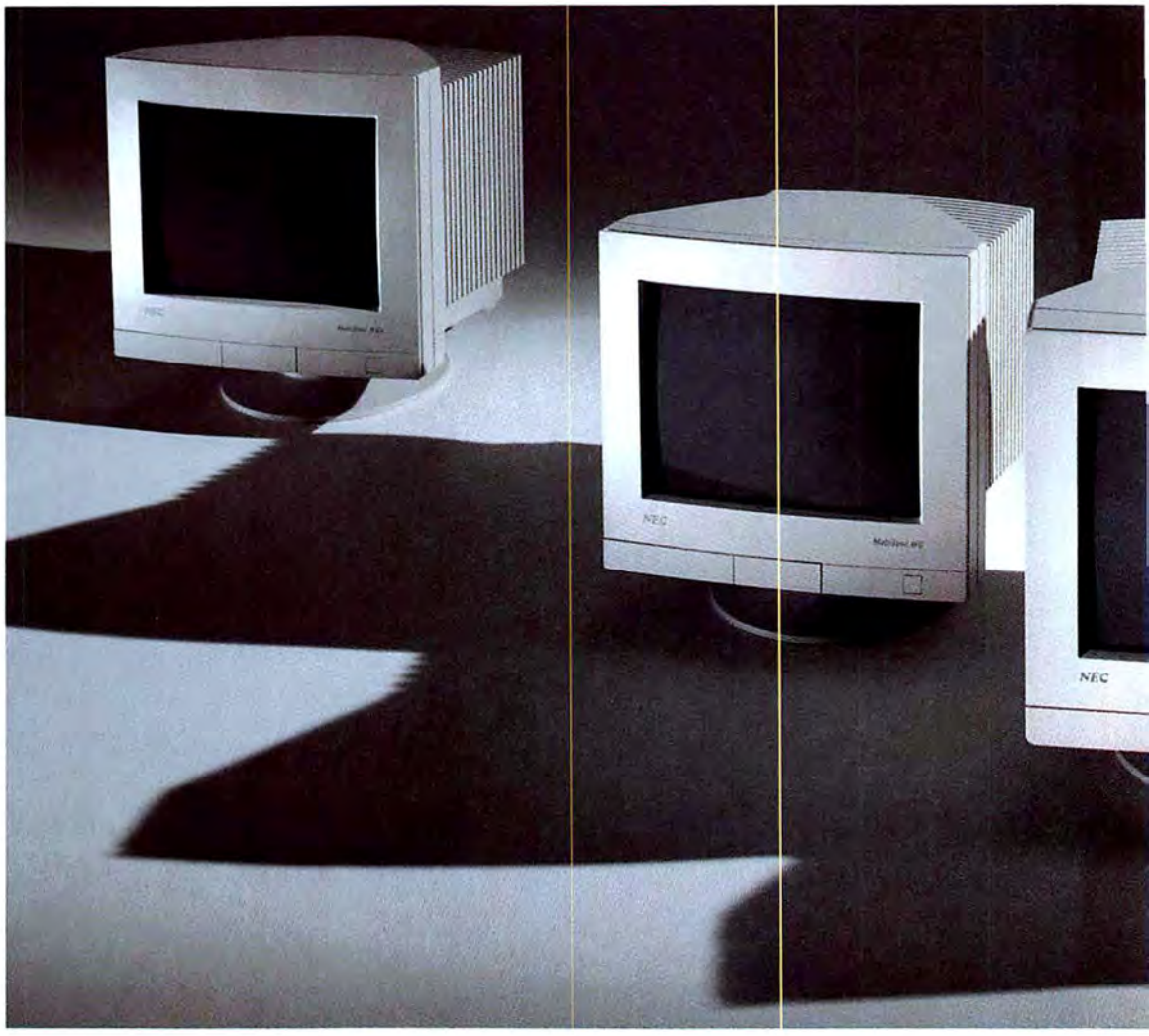
Beginners should look at Nelson's book, which is friendly and to the point; Poole's book is longer and more thorough.

Bob LeVitus recently finished new editions of his books *Dr. Macintosh* and *Son of Stupid Mac Tricks*, both published by Addison-Wesley (Reading, Massachusetts, 1991).



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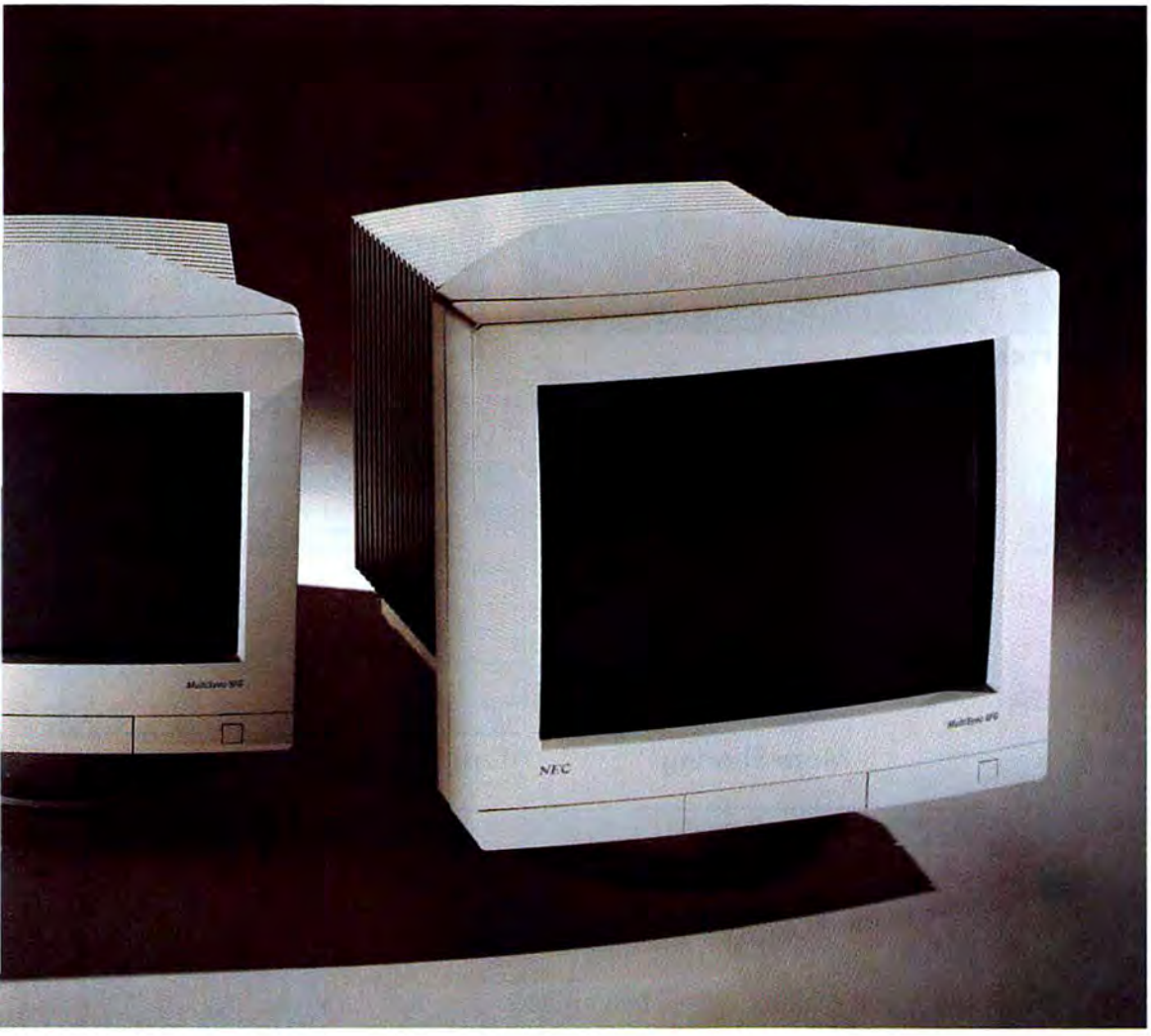
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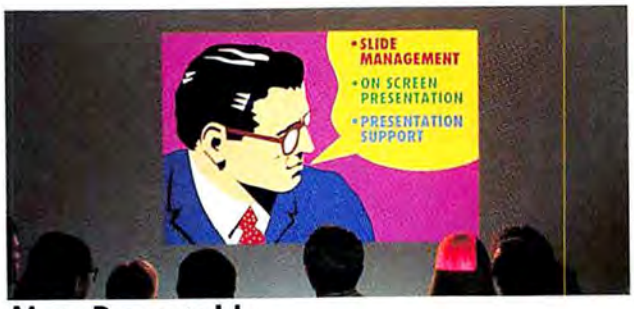
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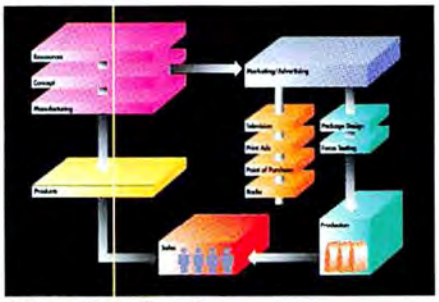
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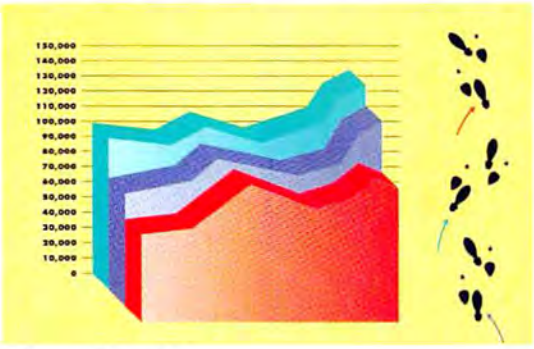
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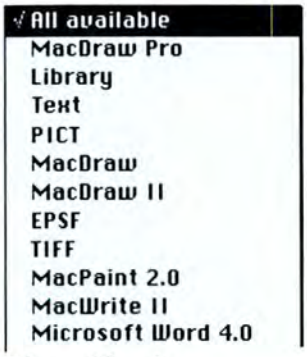
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TIP SHEET



Do you have an undocumented Macintosh tip you're willing to share? MacUser *pays $25 for every tip used, and the Tip of the Month earns $100.*

✉ *Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404.*

You can also contribute tips electronically via Zmac, the on-line service for MacUser. *Send them to Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.*

Compiled by Gregory Wasson

Canvas

The way to produce filled or patterned text in Canvas is not readily obvious, because the fill tool fills the background instead of the actual letters. Here's an easy method for creating filled text.

1. Type the text. Thick letters work best.

2. Draw a rectangle (or other shape) so that it covers the text, and fill the rectangle with a shade or pattern.

3. Select the ink-manager tool (indicated by the word Copy near the bottom of the toolbox) and drag over to Bic (black is clear). This eliminates the black in the text and fills it with the pattern or shade (see Figure 1).

LaserWriters can be finicky about printing documents that use the ink manager, but you should have no problems using non-PostScript printers such as the DeskWriter.

Marc Knoedler
Millington, MI

Printer Descriptions

In some applications, such as QuarkXPress, PageMaker, FreeHand, and Illustrator, the Print or Page Setup dialog boxes let you select a specific printer, such as a LaserWriter II, QMS PS-810, or Linotronic 300. Your printer choice affects the PostScript code that is sent to the printer and can occasionally limit the output

Tip of the Month

System 7 and ResEdit

Several of the commands in System 7's Finder lack keyboard command equivalents. Some obvious ones spring to mind — Command-M for Make Alias and Command-P for Page Setup. You can easily add these keyboard shortcuts to the Finder's Edit menu with ResEdit. To do this, you need a copy of ResEdit; if you don't have one, try a local user group or an on-line service such as CompuServe or America Online.

1. Make a copy of the Finder, and work only with the copy — editing an active file with ResEdit is always a bad idea (in fact, ResEdit 2.1 doesn't let you work with the active Finder). Open the copy of the Finder in ResEdit.

2. Locate the fmnu resource (resources are listed alphabetically). Double-click on the icon, and then double-click on ID 1252. This brings up a window filled with arcane text and numbers.

3. The far-right column contains some familiar strings of text, such as New Folder, Close Window, and other Finder menu commands. The keyboard command equivalents for these (and all other Finder menu items) are stored in the third character before the name of each item — the *N* before New Folder and the *W* before Close Window, for example, are what determine the keyboard command equivalents for these options. A menu item without a keyboard command equivalent has only a box in this place.

4. To change or add a keyboard-command equivalent, select the appropriate character in the far-right column and type in uppercase the character you want instead (see Figure A). It's important that you select *only* the character you want to replace. If you delete the character and then replace it, the Finder may reorder your menus or behave in other unpredictable ways.

5. Save the changes, and quit ResEdit. To restart with the newly customized Finder, move the current Finder out of the System Folder, rename the Finder copy so it's called Finder, and restart your Mac.

The new keyboard command equivalents should appear on the menus once the new Finder has loaded.

Joshua Smith
Irvine, CA

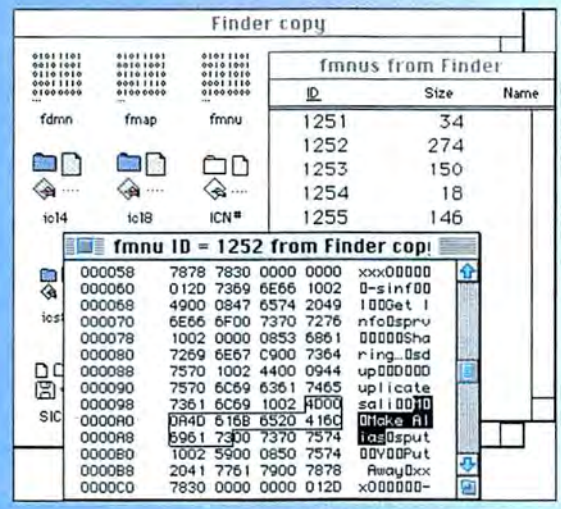


Figure A: You can make System 7's new Finder even better by using ResEdit to add new keyboard command equivalents to menu items such as Make Alias or Page Setup. Here, Command-M (the *M* at the beginning of the highlighted sequence) has been added to the Make Alias option.

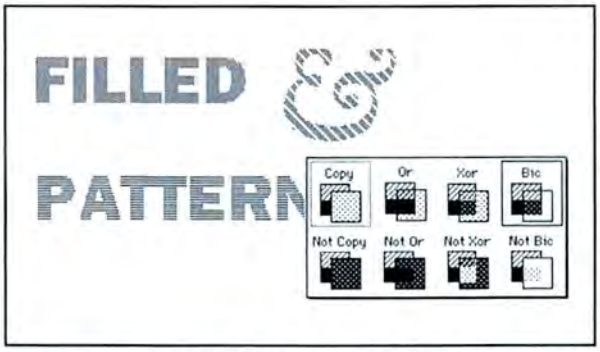


Figure 1: You can quickly add fills or patterns to text in Canvas 3.0 by using the Ink Manager tool and choosing the Bic (black is clear) option.

quality. This is because when you choose a printer, the application uses a printer-description file to determine what information to send to the printer. Some descriptions are built in to the application; others use separate printer-description files. These files are usually identified by a special filename extension, such as APD for Aldus applications, PDF for Quark programs, and PPD for Adobe applications. The printer descriptions affect gray levels, page margins, and other factors — some permit more versatility than others.

It would be great if these descriptions were perfect, but that's not always the case. If you suspect that the printer description is limiting the quality of your output, try telling your application that you're printing to a Linotronic 300, which is a high-end imagesetter. In many cases, this printer description gives the printer the ability to print the best-looking page instead of sending a restricted copy of the page's code.

Dave deBronkart
Salem, NH

Word 4.0

Here's how to put a Zapf Dingbat check mark into a box with a drop shadow:

1. Press Command-Y to see the symbols for paragraphs, spaces, and tabs.

2. Press Command-Option-Backslash, and then type `O(o,4)`.

3. Select the text (including the backslash), and choose Zapf Dingbats from the Font menu. Press Command-Y again to hide the paragraph and space symbols. You now see a box containing a check mark. You can experiment with the various boxes and check marks in Zapf Dingbats until you have a combination you like.

Nathan Leon
Pleasanton, CA

Navigator 3.0.4

When creating a message in Navigator 3.0.4, type the first few letters of the recipient's name into the Msg To field and select Lookup.

If Navigator finds only one matching entry, it will paste the name into the field. If it finds multiple matching entries,

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it will open the address book and highlight the first one.

Craig O'Donnell
Boston, MA

StyleWriter

Here's how StyleWriter owners can reduce printing time for large word-processing documents. The StyleWriter is definitely no speed demon when used with any computer less powerful than a Mac LC. But if you don't mind if the print quality is slightly less than the best, try this: Use a bold TrueType font for your text. When the Print dialog box appears, choose the Print Faster option. The document will print in about one-third of the time, and the output will be almost as good as that of the best printing quality.

Michael J. Hull
APO, NY

Finder

Sometimes you just can't throw a folder away: You place it in the Trash and select Empty Trash, and you keep getting a message reading, "The Trash couldn't be emptied (a file was busy or a folder was not empty)." Shortly thereafter, the (nonempty) folder reappears on your desktop. Even though there are no "busy" files in the folder, there isn't anything you can do to throw it away.

I've found that this happens when I've closed a document within an application but haven't yet quit the application. In such a situation, the Finder lets you throw away the closed document directly, but if you try to throw away a *folder* containing the document, you run into this snag: Although the file itself has been trashed, there is no way to throw the folder away until you've quit the application.

To get around this when you're trashing a folder, remember to select its contents by opening the folder and pressing Command-A. Throw away the selected files, empty the Trash, and *then* throw the folder away. This procedure, which works every time, has let me discard seemingly "locked" folders without resorting to any of the nuclear weapons that are available for unlocking files.

Bruce McEachern
Davis, CA

If you do want to resort to "nuclear weapons," try HellFolderFix, a utility available from freeware sources such as on-line services and user groups. You can download HellFolderFix from the Application Library of Zmac's Download & Support Forum (HELLFL.SIT is the filename). — Ed.

General

Before buying new hardware or software, check with your credit-card company to see if it offers an extended warranty on purchases (usually for a year beyond the warranty that already covers the product). If so, use your credit card to make your purchases — but find out first whether you need to register the merchandise in order to qualify for the extended warranty. For example, if you use your credit card to buy a laser printer whose manufacturer provides a one-year warranty, the warranty is now extended by another year at no cost to you.

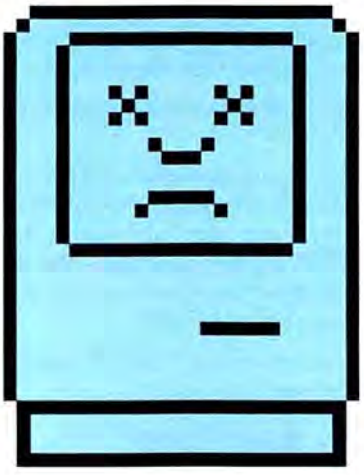
Bob Greenspan
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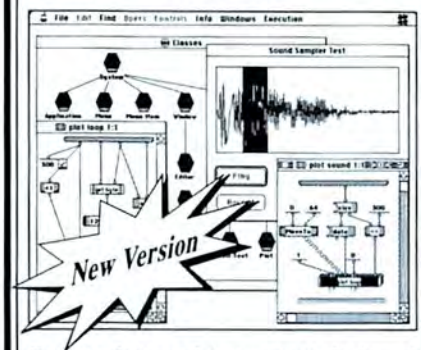
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Don't want to wait for an answer? Post your question on Zmac, MacUser's *on-line service, and get a reply from Bob, Andy, or one of the other* MacUser *experts. See the masthead in this issue for instructions on how to sign up.*

By Bob LeVitus and Andy Ihnatko

The Many Systems of Eve

Q. I've installed System 7 and really like it, but because one of my favorite programs is allegedly incompatible with it, I'd like to be able to have System 6 available too.

However, when I copied a version 6.0.5 System Folder onto my hard disk and tried to restart, my Mac wouldn't boot properly. I have been told that this is because there were two System Folders on the same drive. How can I have System 7 *and* System 6 on my Mac at the same time?

Ed Notmyrealname
via Zmac

Andy: The Mac becomes profoundly befuddled when it goes through its startup procedure and finds more than one System Folder on the same volume. At best, you'll have no control over which System Folder the Mac boots from — although typically it's the folder that was created first — and at worst you'll get a cheerful system error such as the one you describe.

But enough preambling! Let's dive into a variety of solutions. (In an attempt to generate an atmosphere of suspense so often absent in computer magazines, I'm saving the best solution for last.)

A shareware program called System Picker (see Figure 1) is the diciest solution. It's an application that searches for folders that contain a System file and then lets you reboot the Macintosh with the System Folder you select. It's dicey because it does something that no

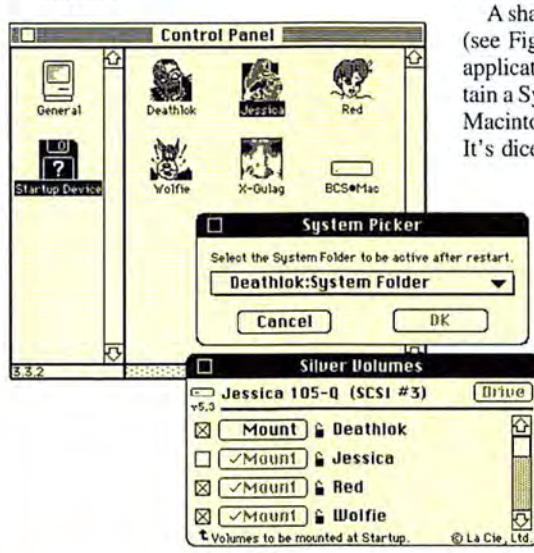


Figure 1: Here are three ways of switching easily between System 7 and System 6: Using a slimmed-down version of System 6 on a floppy disk (top), using an INIT such as System Picker (middle), or partitioning your hard drive and installing different systems in separate volumes (bottom).

✻... But Were Afraid to Ask

Throughout the grand march of history, pivotal events have hinged on the importance of men and women unafraid to ask a simple question. Take the tragedy of Amelia Earhart's last flight, for example. Historians now agree that it was largely the fault of her copilot, who was too timid to ask the famed aviatrix if she had remembered to have the sea-landing pontoons installed during the last fuel stop.

So if you have a question that seems just too simple to ask, send it on in! You may save countless lives. If you're concerned about ridicule and abuse from coworkers, fret not: We'll say the question was sent in by an athlete who, in our opinion, was single-handedly responsible for losing the World Series for the Boston Red Sox at some time or another.

Q. I'm in charge of maintaining a FileMaker Pro database, and one of my biggest problems is that of blank fields and records in our inventory database — that is, whoever enters the data creates a new record with nothing in it or somehow omits a key piece of data.

My problem is finding these pesky rascals and getting rid of them. It seems as though I should be able to search for an empty field by using the Find command and leaving the fields blank, but that doesn't work. Help!

Bill Buckner
First Base, Red Sox, 1986 (Game 6)

Andy: Well, Bill, you've learned the fundamental truth of application development: Programs would work just great if it weren't for the — pardon my language — users.

But, in fact, there is a simple built-in way to find an empty field: Use the Find command and enter = in every field where you want to find blank data. The equal sign means "Find the following data, exactly," so when you follow it with absolutely nothing, you're telling FileMaker to look for zip.

And if those empty fields are a constant source of irritation, why not fix things so that FileMaker won't accept blank fields? In Layout mode, go to Define Fields, select the field name, and click on the Options button. Check the "Verify that the field value is not empty" box, and FileMaker Pro will issue a savage tongue-lashing to any pinhead who tries to create a record without entering data in that field. (Or you can threaten to tell the boss that the pinhead was printing résumés on the office LaserWriter — whichever appeals to your sense of justice.)

program is technically supposed to do: It "blesses" the chosen folder as The One And Only Folder that the Mac should examine for System files. I managed to mess up my hard disk with an earlier version of the program, so I don't trust it. But just for the record, the current version (1.0b8 at this writing) seems to work just fine.

If you're going to be using System 7 primarily and you don't need many INITs or control panels when you use System 6, you can try creating a floppy disk that contains a minimalist version of System 6.0.5. The System, Finder, printer drivers, and control panels fit comfortably on one 800K disk. If you can also fit Suitcase II, from Fifth Generation Systems, on the disk, you can access all the fonts and DAs that are stored on your hard disk. With this setup, when you want to switch to System 6.0.5, you merely shut down your Mac, chonk your System 6 floppy into the drive, and restart. This scheme always works, because the Mac always checks the internal floppy drive for System files before checking any other drives.

I wouldn't recommend trying to create a System 7 startup disk, however. The only way you can get it all on one disk is to create an insanely stripped-down version of the System; it'd be like embarking on a camping trip equipped with nothing but a roll of Saran Wrap and an extra pair of shoelaces.

At last, the shocking conclusion. The best possible solution is to have the old and new Systems on separate volumes and then use the Startup Device control panel (called the Startup Disk under System 7) to select which volume your Mac should boot with. If you have more than one hard drive (say an internal and an external drive), you can install a different system-software version on each one without further muss or fuss. If you have only one hard drive, then partition its disk into separate volumes, using a utility such as La Cie's Silverlining. Then put a folder with System 6 onto one volume and System 7 onto another. This method is simple and foolproof and won't cause you to turn into a pillar of salt.

Unfortunately, the Mac Plus, because it lacks the special section of PRAM (parameter RAM) where the control panel records the startup info, can't use the Startup Disk control panel. But don't you fret: Most partitioning programs worth their salt come with a DA for determining which SCSI partitions are mounted on the startup disk and which are left in the slipcase, so to speak. Silver Volumes, supplied in the Silverlining package, is the DA I use. When I need to switch to System 6, I open the DA and order that Jessica (System 7) is not to be mounted and that Deathlok (System 6.0.5) should be mounted in its place.

Bob: For those who are using two or more volumes, there's a freeware INIT called SwitchBoot. It lets you choose which volume you want to boot from at startup time. Without it, you have to wait for the Mac to boot, use the Startup Disk control panel, and then restart. With SwitchBoot, if you hold down the S key during startup,

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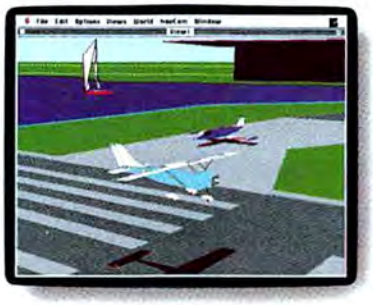
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you'll see a dialog box with a list of your bootable hard drives. Choose one and click on the Reboot button, and your Mac will start up with the System on that volume.

For those who switch between hard drives (or partitions) more than a couple of times a day, SwitchBoot is a real time saver. Unfortunately, like everything pertaining to startup devices, SwitchBoot doesn't work with a Plus or earlier Mac models.

SwitchBoot and System Picker are available from user groups and on-line services.

Formatting 400K Disks As HFS

Q. I thought I read somewhere that there's a key combination that lets you format 400K disks as HFS (Hierarchical File System) disks. Is there such a beast, and if so, what is it?

Cecil Habermacher
Houston, TX

Bob: There is indeed such a beast. But first, a word for our readers who're too young to remember 400K disks and MFS (Macintosh File System).

In the old days, all Macs came equipped with 400K drives, and all floppy disks were formatted with MFS. When the Mac Plus appeared in 1987, Apple introduced HFS, the now-familiar system that allows folders within folders. The difference between the two systems is that MFS was a flat-filing system (every file on a disk was at the same level, as if there were no folders) and HFS is, well, hierarchical (files are separated by the folders they're in). With MFS, folders were visible only when you looked at the disk in the Finder, and they disappeared in the Open and Save dialog boxes.

Now for the answer to your question, but before I begin — we don't recommend storing important information on disks formatted this way, because 400K disks are tested only on one side during manufacturing: To format a 400K disk as an HFS disk, simply hold down the Option key when you click on the One-Sided button in the disk-initialization dialog box and continue to hold it down while the disk is being initialized.

Cheap SuperDrive Solution?

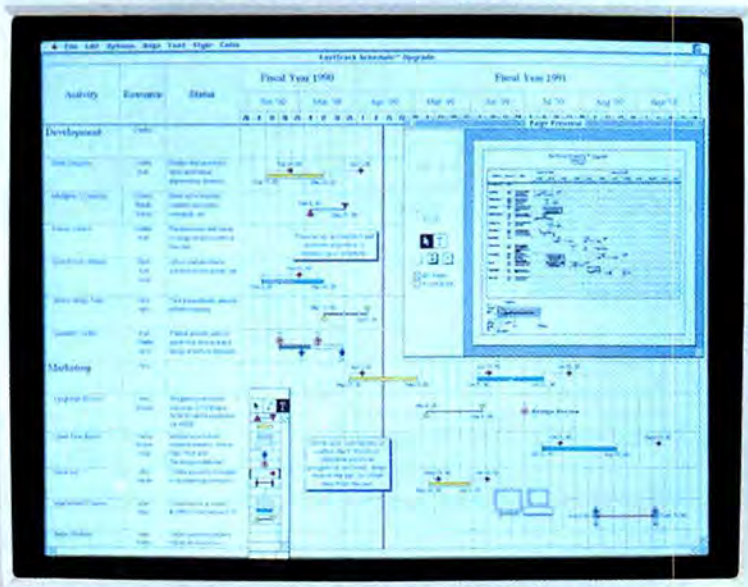
Q. I'm looking for a reasonably priced internal SuperDrive. I've looked at — and rejected — Apple's pricey upgrade, because it requires new ROMs and floppy chips. And as nice as it would be, a IIfx upgrade would blow my budget. I know there are external SCSI drives that claim high-density and DOS-disk compatibility, but with an empty spot in my Macintosh case, they seem like a clunky alternative.

There must be a bunch of Mac II owners stuck in the same boat — *somebody* must have such a product!

Warren L. Gawve
Lockport, NY

Andy: Well, Warren, you're right, and you're wrong. Yes, there are a whole bunch of Macintosh II (and Mac SE) owners out there who have 800K floppy drives and want to upgrade to the high-density 1.44-megabyte SuperDrives. Unfortunately, no one has the product you describe (at least

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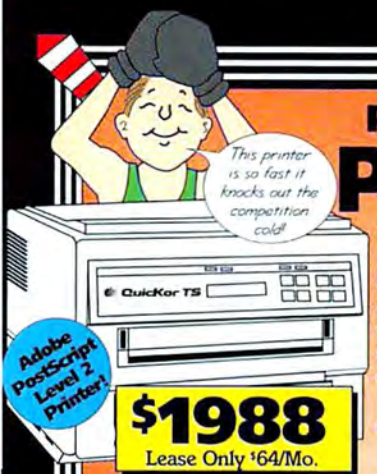
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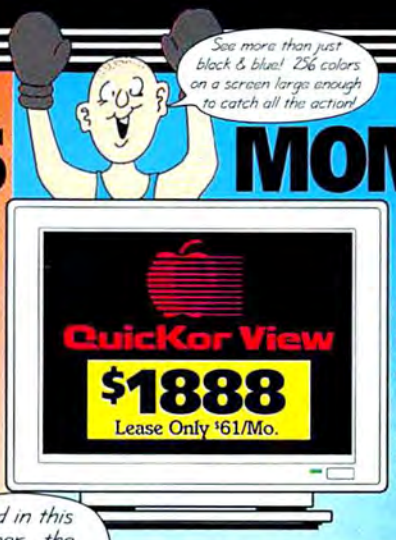
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as far as Bob and I know).

Here's the problem: Moving from an 800K drive to a SuperDrive isn't a simple little upgrade. For starters, your Mac lacks the basic circuitry that's necessary for moving data in and out of a high-density drive. And even if it had the right circuitry, your Mac II's old ROM would still think that it was hooked up to a puny 800K drive.

So you're stuck. You really have only two options: You can swallow your pride and spring for the official Apple upgrade, or buy one of those external SCSI disk drives you mentioned. These are standard 3.5-inch, 1.44-megabyte drives that connect through the SCSI port. The Macintosh treats one of these drives like a 1.44-megabyte SCSI hard drive, so no ROM or disk-controller upgrades are necessary.

Personally, I favor the external-drive solution to the official upgrade. It costs about $200 less, and these drives typically come packaged with some extra goodies, such as an INIT that mounts DOS disks right on the desktop without using Apple File Exchange as an intermediary.

How to Turn On the Spooler

Q. How do you turn on Apple's print spooler? I've installed both Backgrounder and Print Monitor in my System Folder, and I still can't figure out how they work.

Is there a way to change the default font for Word 4.0? I'm sick of changing it from the annoying Geneva to Times.

Mike Baker
East Wenatchee, WA

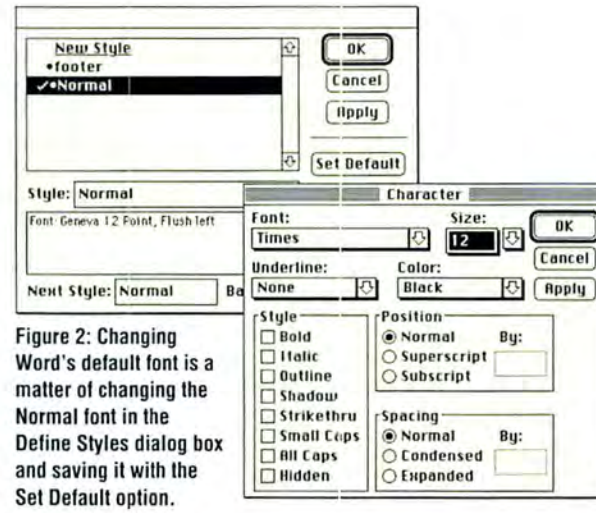


Figure 2: Changing Word's default font is a matter of changing the Normal font in the Define Styles dialog box and saving it with the Set Default option.

Bob: To turn on the spooler, open the Chooser, select your printer, and click on the On button next to Background Printing. By the way, if you're using a version of the system software earlier than System 7, print spooling works only in the MultiFinder mode; you can't use it if you're running under the Finder.

And now for your second

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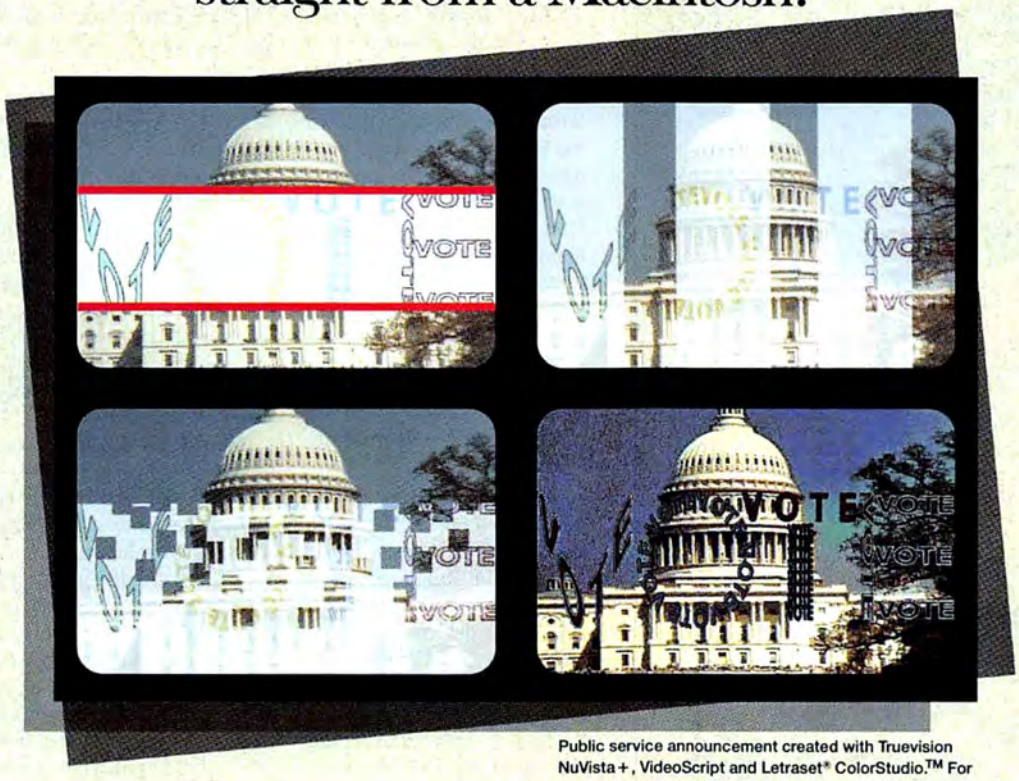
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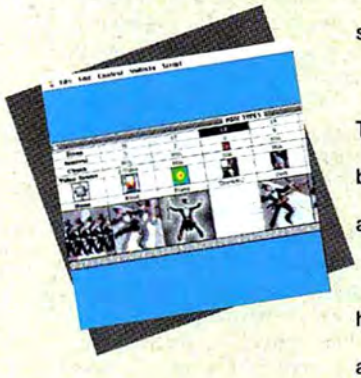
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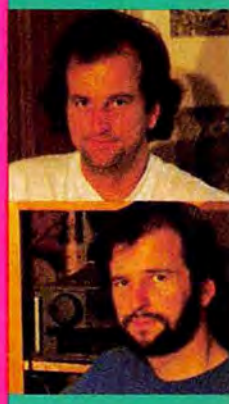
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question: There is an easy way to change the default font in Word. Choose Define Styles from the Format menu, click on the Normal style, pull down the Font menu (or type Command-D), choose the font you want, and click on the Set Default button (see Figure 2). A dialog box will confirm that you want to record your choice to the default style sheet. Click on OK. That's it — your default font is changed.

Keeping a LaserWriter Running, Part 2

OK, we blew it. To wit: our advice to Gloria Baciewicz last July (see "Keeping a LaserWriter Running," page 234).

Gloria's dealer told her to switch her LaserWriter IISC on before starting up her Mac and leave it running as long as the Mac is turned on. We said she didn't have to. We were wrong. Because her printer connects via the SCSI port, she *should* turn it on before starting up her Mac and leave it running whenever her Mac is powered up. SCSI devices should be turned on before you turn on your Mac — otherwise the entire SCSI chain won't work.

Our excuse is that we thought Gloria's printer, like ours, connected to her Mac via the printer port, in which case she could have turned it on and off at will.

Heap-Big Tool

Q. Thanks for pointing out the necessity of keeping some extra space in my system heap (see "The System Heap," June '91, page 247). However, I have no idea how to find HeapTool, the shareware control panel you mentioned.

Bud Traynor
Maxwell AFB, AL

Andy: It's a wonder I can even make it to the computer to write this reply, Bud, because my office is buried in a blanket of letters three feet deep, all of them asking exactly that same question.

HeapTool is shareware, which is copyrighted software, distributed free of charge, whose author requests that you pay a small fee if you like the program. To get HeapTool, you have to turn to the usual sources of shareware and freeware. First, there are on-line services (such as Zmac and America Online), which have boatloads of software, some literally only hours old.

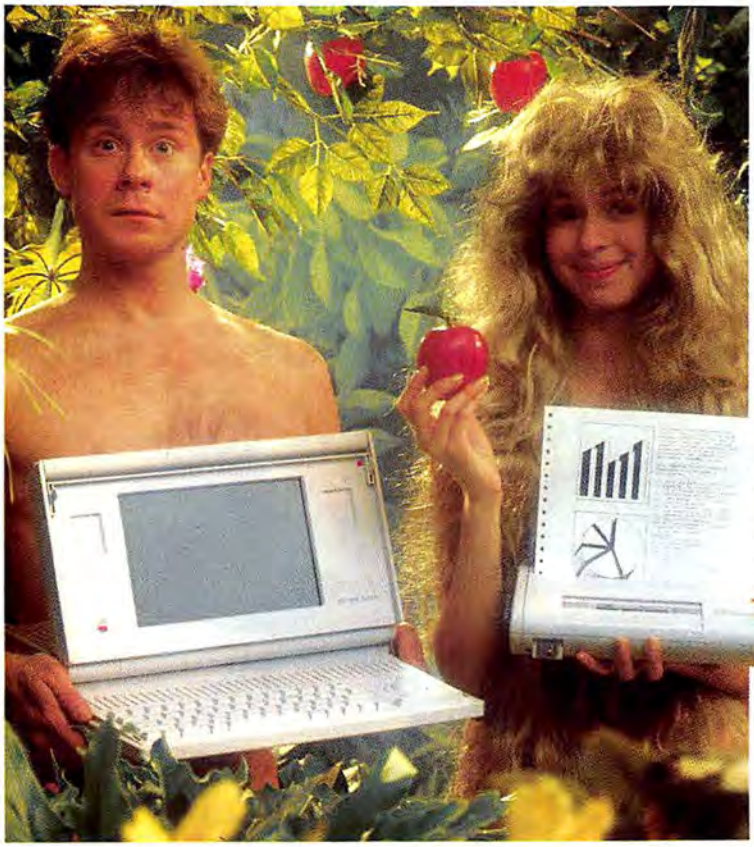
Second, you can try a commercial shareware distributor. This kind of outfit, with or without the shareware authors' consent, assembles shareware collections on-disk and sells them for a nominal duplication fee (usually between $6 and $10). Shareware distributors usually advertise in the back of glossy, information-packed magazines such as the one you're holding in your hands right now.

Finally, you can turn to the vast national brotherhood/sisterhood of Macintosh user groups. Almost every user group sells disks of public-domain and shareware software. All you have to do is give your local (or not-so-local) user group a call, and ask what's available. (Call Apple at [800] 538-9696, ext. 500, and ask for a list of the groups in your area.)

Of course, the fact that you've paid a user group or a shareware vendor for the disk or paid an on-line service for the downloading time does *not* mean you've paid for the software itself; if you enjoy the software, you're still honor-bound to pay the measly, piddling, hardly significant little registration fees that the authors request.

Bob: One last thing: If you've upgraded to System 7, you don't need HeapTool — the system software automatically adjusts the system heap for you.

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MiniFinders

Welcome to MiniFinders, your personal buyer's guide. For this special utilities edition, *MacUser* editors have carefully selected and evaluated each product, assigning ratings from one to five mice, in half-mouse increments; only products that have received a mouse rating appear in MiniFinders. All the ratings are relative within a category, and because the market is constantly changing, our ratings change too. We've indicated all our Eddy (Editors' Choice) Award winners with a ★, along with the year they were recognized for their excellence. For detailed product information, look for the original, full-length review in the issue cited in parentheses at the end of each MiniFinder entry. A HyperCard stack of the entire MiniFinders database is usually available on Zmac, our CompuServe on-line service. Vendor addresses, product prices, hardware specifications, and software features change quickly. Call vendors to check product information and System 7-compatibility.To update the MiniFinders database, send written notification to MiniFinders, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

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General Utilities

AFE (Apple File Exchange) ½

AFE (Apple File Exchange) is one of the utilities that come free with the Mac System Tools disks. Has a simple interface and works with a wide variety of data-transfer methods. Best feature is that it works with current MacLinkPlus Translators. By itself, AFE translators are limited to MacWrite generic text. Free. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Oct '89)

After Dark ½

After Dark, a screen saver, introduced the concept of display modules. Includes 30 color modules such as Flying Toasters and the psychedelic Satori. Add-on package, More After Dark, contains 25 extra modules. Version 1.1 reviewed. Version 2.0u shipping. Requires Mac 512Ke or later; sound requires System 6.0.3 or later. $49.95; More After Dark, $39.95; both packages, $69.95. Berkeley Systems, Inc., 2095 Rose St., Berkeley, CA 94709. (415) 540-5535. (July '90)

AutoSave II

AutoSave II provides insurance against system crashes. It saves your work automatically at intervals from 1 to 99 minutes. Compatible with many applications but not recommended for use with databases. Version 1.01 reviewed. Version 2.0 shipping. $49.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Dec '89)

ClickChange ½

ClickChange is a control panel that customizes your Mac's interface by modifying various features such as window borders, title bars, text, menu background, sounds, and dialog boxes. Comes with a library of more than 40 cursors and 30 excellent sounds. Extremely easy to use. Version 1.0.3 reviewed. Version 1.0.4 shipping. Mac Plus or later and System 6.0.3 or later. $79.95. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Mar '91)

Desk ½

Desk is a collection of seven powerful DAs: DeskPaint, DeskDraw, DeskWrite, DeskSecretary (appointment calendar), DeskCom (modem control), DeskCalc, and DeskFile (minidatabase). Although not on a par with Microsoft Works, Desk lets you access its DAs from within any application. Version 1.0 reviewed. Version 3.03 shipping. Requires Mac Plus or later; DeskPaint requires a color display system, 2 MB of RAM, and a hard-disk drive. $399.95. Zedcor, 4500 E. Speedway #22, Tucson, AZ 85712. (602) 881-8101. (Jan '91)

HandOff II

HandOff II lets you launch documents from applications that are not the ones the documents were created with. HandOff II works with a variety of document types (including graphics) and lets you simply double-click on documents created with earlier program versions to open them. Its ability to remember pixel depth (colors or grays) and volume settings for different programs is also useful. Version 1.1 reviewed. $99. Connectix Corp., 125 Constitution Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Feb '91)

LifeGuard ½

LifeGuard is an INIT that acts like an electronic alarm clock, letting you know when a user-defined length of time has elapsed. You control the frequency of breaks as well as the interval allowed before it's time to resume work. Audible sounds or flashing on-screen signals serve as warnings, and a "snooze" function can override the alarm. Some basic information on exercise and ergonomics is also provided. Go ahead, take five — it's good for you. Version 1.0 reviewed. $79.95. Visionary Software, Inc., P.O. Box 69447, Portland, OR 97201. (800) 877-1832 or (503) 246-6200. (Feb '91)

Mail Rater

Mail Rater is a large HyperCard stack that determines postage rates. Erasable data stacks. Includes HyperCard. Version 1.1 reviewed. Version 3.0 shipping. Requires Mac Plus or later and HyperCard 1.2.2 or later. $29.95. Tight Line Software, 27601 Forbes Rd., Ste. 50, Laguna Niguel, CA 92677. (714) 367-0007. (Feb '90)

Maxima ½

Maxima breaks the 8-MB limit on your Mac SE/30 or Mac II. Lets your applications use up to 14 MB of virtual hard-disk memory. Can also create a lightning-fast RAM disk. Elegant design is flawless. No RAM disk automatic write-through or volume-size partitioning features. Version 1.0.5 shipping. Requires SE/30 or Mac II and hard-disk drive. $129. Connectix Corp., 125 Constitution Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Sept '90)

MicroRX SE1

MicroRX SE1 is a HyperCard stack that diagnoses your SE's problems. The details are meant for qualified service techs, but anyone using it can gain better knowledge of what's inside the SE. Well done and easy to use. Version 1.01 shipping. Requires HyperCard 1.2.1 or later. $99. MicroMat Computer Systems, 7075 Redwood Blvd., Novato, CA 94945. (415) 898-6227. (July '90)

MockPackage Plus Utilities ½

MockPackage Plus Utilities is a set of extremely powerful DAs. Includes a text editor, text printer (supports LaserWriter), charter, terminal, EZmenus, and several other useful tools. Version 4.4 shipping. Requires Mac Plus or later. $49.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (Mar '87)

Now Utilities ½

Now Utilities is an inexpensive collection of tools: StartUp Manager INIT (controls INITs, control panels, and Chooser documents); Super Boomerang INIT (adds navigation features to Open and Save dialog boxes); Profiler (hardware/software analysis); Now Menus; WYSIWYG Menus; FinderKeys; MultiMaster (desktop and menu-bar management); DeskPicture (custom desktop background), Customizer (alters windows, folders, and the like); Alarm Clock; Previewer (previews printed documents); Screen-Locker (a moderately secure password system that's crash-prone with other INITs). Version 2.0 reviewed. Version 3.0 shipping. $129. Now Software, Inc., 520 S.W. Harrison, Ste. 435, Portland, OR 97201. (800) 237-3611 or (503) 274-2800. (Apr '91)

Partner ½

Partner is an INIT that lets you edit embedded graphics while using DTP or word-processing programs. Can put graphics files into applications that don't usually accept them. Version 1.0 reviewed. Requires Mac Plus or later with at least 2 MB of RAM, System 6.0.3 or later, and MultiFinder. $99. Salient Software, 124 University Ave. #103, Palo Alto, CA 94301. (415) 852-9567. (May '90)

MICE RATINGS ½ 1 1½ 2 2½ 3 3½ 4 4½ 5

Personality ⭐⭐⭐
Personality is a control panel that lets you change the look and feel of your Mac's interface. You can modify scroll bars, menus and their backgrounds, window borders, title bars, text, and so on. Extremely easy to use, Personality is unique, because it can change the menu font and create 3-D menus. Provides only eight cursors and doesn't include any sounds. Version 1.0.1 reviewed. Requires Mac Plus or later and System 6.0.2 or later. $59.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-9676. (Mar '91)

POWERmenus ⭐⭐⭐⭐⭐
POWERmenus is two products in one. The first allows full access to menus from anywhere on-screen. The second, Gadgets, includes a phone dialer, notepad, and useful launchers for DAs, control panels, and applications. Version 1.03 reviewed. Requires System 5.0 or later. $79.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Jan '90)

Pyro! ⭐⭐⭐⭐⭐
Pyro! is a screen saver with 12 user-selectable entertaining modules. Good use of color. Handles background tasks well. Can automatically switch to simpler modules when the background load is heavy. Version 4.0 shipping. Requires Mac Plus or later. $39.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (July '90)

QuicKeys 2 ⭐⭐⭐⭐
QuicKeys lets you make full use of your Apple extended keyboard. Assign any command (menu choices, DAs, and the like) or series of text blocks and/or commands to any key or key combination. Enormously powerful. This new version has added the capability to run macros that trigger sequences of tasks, but QuicKeys 2 still can't handle conditional macros. Some applications, INITs, or control panels may have incompatibility problems. Version 2.0.1 reviewed. Version 2.1 shipping. $149.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (May '91) ★'87 Eddy

Screen Gems ⭐⭐⭐⭐
Screen Gems is a package of five color utilities for the Mac II. Color Desk puts art onto your desktop, Dimmer dims the screen when the Mac is inactive, and Switch-a-Roo lets you switch between any two color modes instantly. Globe is a neat demo, and TN-3 lets you customize the Finder's Color menu. Version 1.0 reviewed. Requires Mac II series with 2 MB of RAM, System 4.2 or later, and a color monitor. $79. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Sept '89)

Stepping Out II ⭐⭐⭐⭐⭐
Stepping Out II is a software alternative to a large-screen monitor. Lets you create a virtual screen (as large as memory allows) inside the Macintosh's 9-inch screen. Automatically scrolls to new document position as you type or draw. Version 2.0 reviewed. Version 2.02 shipping. Requires Mac Plus or later. $95. Berkeley Systems, Inc., 2095 Rose St., Berkeley, CA 94709. (415) 540-5535. (Oct '88)

SuperGlue II ⭐⭐⭐⭐⭐
SuperGlue II, an excellent print-to-disk program, offers superior operation along with many nice touches, such as Glue Notes (Post-it-like notes) and One-Timer, an Fkey that makes operation immensely easier. Version 2.01 shipping. Requires Mac Plus or later and System 6.0.3 or later. $119.95. Solutions, Inc., P.O. Box 783, Williston, VT 05495. (802) 865-9220. (Nov '89)

Tempo II Plus ⭐⭐⭐½
Tempo II Plus is a powerful macro program designed for owners of extended keyboards. Especially good for building sequential macros. Unique features include conditional branching and the ability to remember menu selections by name. Tempo II Plus' use of several separate files is potentially confusing, but the bundled installer application helps a lot. Version 2.01 reviewed. Version 2.0.3 shipping. $169.95. Affinity Microsystems Ltd., 1050 Walnut St. #425, Boulder, CO 80302. (800) 367-6771 or (303) 442-4840. (May '91)

Virtual 2.0 ⭐⭐⭐⭐⭐
Virtual is a virtual-memory program. Provides up to 15 MB of effective RAM, using hard-disk drive for temporary storage. Excellent performance and superb support. Version 2.0 reviewed. Version 2.0.3 shipping. Requires Mac Plus or SE (with accelerator card), II (with optional 68851 PMMU), SE/30 or later. $199; with PMMU chip, $275. Connectix Corp., 125 Constitution Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Apr '90) ★'89 Eddy

● BACKUP & FILE RECOVERY

911 Utilities ⭐⭐⭐
911 Utilities undeletes files without first copying and moving the deleted files. Has a good trouble-shooting guide. Has poor file-recovery performance and poor performance in panic situations. Difficult interface. The popular Virex virus-protection program is included. Version 1.0 shipping. Requires Mac Plus or later. $149.95. Microcom, Inc., 500 River Ridge Dr., Norwood, MA 02062. (800) 822-8224 or (617) 551-1000. (Apr '91)

AutoBack ⭐⭐⭐⭐
AutoBack creates copies of data files on another hard-disk drive (or on selected tape drives) whenever you save or activate a file. Doesn't back up applications and System files. Can be set to back up only selected files, although these options are limited. Performance is good. Version 2.0 shipping. $99. TerraNetics, 1538 N. Martel Ave., Ste. 413, Los Angeles, CA 90046. (818) 446-7692. (Aug '90)

Backmatic ⭐⭐⭐⭐⭐
Backmatic is an INIT that scans your hard disk whenever you shut down and backs up all the changed files. Can back up to floppies, a folder on your hard disk, or a server. Wide-ranging, easy-to-use exclusion abilities. Slow but utterly reliable. Version 2.0 shipping. Requires Mac Plus or later and System 4.2 or later. $99.95; 5-user pack, $295; 10-user pack; $495. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (July '90)

Cat•Back ⭐⭐⭐½
Cat•Back combines disk cataloging and backup. Good cataloger but backing up from one partition to another on the same drive crashed the program. Other performance was OK. Can perform incremental and mirror-image backups. The interface and overall operational procedure need work. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac 512Ke or later. $39.95. Master Manufacturing, Inc., 118 N. Cypress St., La Habra, CA 90631. (213) 694-6861. (Aug '90)

Complete Undelete ⭐⭐⭐⭐⭐
Complete Undelete is a superb file-recovery program. Excellent interface and very fast. Recovers all deleted files and fragments of partially overwritten files. Version 1.1 shipping. Requires Mac Plus or later and System 4.2 or later. $79.95. Microcom, Inc., 500 River Ridge Dr., Norwood, MA 02062. (800) 822-8224 or (617) 551-1000. (Jan '90)

Disk First Aid ⭐⭐⭐
Apple's reliable Disk First Aid is a simple diagnostic tool for floppies and hard-disk drives. It has limited file-recovery abilities compared with blockbuster utility packages such as Norton Utilities for the Macintosh, but you can't complain about the price. Free with every Mac. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '91)

Fastback II ⭐⭐⭐⭐
Fastback II is a backup utility that supports incremental and differential backups and offers a choice of compression levels. Backup configurations can be saved as preference files. Macro language supports automated procedures. Nonstandard dialog boxes are unclear. Version 2.0 reviewed. Version 2.10 shipping. Requires Mac 512Ke or later and System 4.2 or later. $189; upgrades, $30. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Oct '89)

HFS Backup ⭐⭐⭐⭐
HFS Backup is a top-class backup program. Quick and reliable. Includes everything from a virus checker to partial imaging capabilities. Can't back up removable-cartridge drives. Version 3.0 reviewed. Version 3.5 shipping. Requires Mac 512Ke or later. $99.95. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Oct '89)

Redux ⭐⭐⭐⭐½
Redux is an excellent incremental-backup program. Lets you back up files, folders, or entire volumes. You can write scripts, using BackTalk, the Redux control language. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.5 reviewed. Version 1.62 shipping. Requires Mac Plus or later. $99. Microseeds Publishing, Inc., 5801 Benjamin Center Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (July '89)

Retrospect ⭐⭐⭐⭐½
Retrospect is a full-featured backup and archival package. Supports storage devices from floppies to DAT drives. Retains AppleShare access privileges. Version 1.1 reviewed. Version 1.3 shipping. Requires Mac Plus and System 6.0.3 or later. $249. Dantz Development Corp., 1400 Shattuck Ave., Ste. 1, Berkeley, CA 94709. (415) 849-0293. (Dec '89) ★'89 Eddy

Shadow ⭐⭐⭐½
Shadow is a DA that automatically backs up selected files at specified time intervals and after specified actions. Doesn't work with all programs (Excel 2.2 in particular). Version 1.23 reviewed. Version 1.24 shipping. Requires Mac 512Ke or later and System 6.0.3 or later. $49.95. Natural Intelligence, Inc., 2067 Massachusetts Ave., Cambridge, MA 02140. (800) 999-4649 or (617) 876-4876. (May '90)

● FILE & DISK MANAGEMENT

CanOpener ⭐⭐⭐⭐
CanOpener is a search-and-retrieval utility: It searches files for specified strings. Reads and

MICE RATINGS ½ ½ ⭐⭐ ⭐⭐½ ⭐⭐⭐ ⭐⭐⭐½ ⭐⭐⭐⭐ ⭐⭐⭐⭐½ ⭐⭐⭐⭐⭐

displays text, MacPaint, PICT, EPS, TIFF, RIFF, and MacDraw II formats. Has an odd-looking interface but is easy to master. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. $125; free upgrades. Abbott Systems, 62 Mountain Rd., Pleasantville, NY 10570. (800) 552-9157 or (914) 747-4171. (Feb '90) ★'89 Eddy

Compactor ↕↕↕↕↕

Compactor is a shareware application that creates the smallest possible compressed files, and it does so quickly. It can also create self-extracting archives that open automatically when you double-click on their icons, even when the Compactor application isn't available. The self-extracting feature adds only 14K to an archive. Compactor unstuffs StuffIt files up to version 1.5.1. Many of the compressed files available on online services have been created with Compactor. Version 1.21 reviewed. Shareware, $25. Bill Goodman, 109 Davis Ave., Brookline, MA 02146. Written inquiries only. (Apr '91) ★'90 Eddy

Copy II Mac ↕↕↕↕

Copy II Mac is a collection of powerful yet easy-to-use disk utilities, including disk-copying, file-editing, and searching capabilities. Version 7.2 reviewed. Requires Mac 512Ke or later. $39.95. Central Point Software, Inc., 15220 N.W. Greenbrier Pkwy. #200, Beaverton, OR 97006. (800) 888-8199 or (503) 690-8090. (Mar '89) ★'85 Eddy

Diamond ↕↕↕

Diamond is an application that quickly compresses or decompresses files saved as archives. It is much less widely used than StuffIt or Compactor, so you won't find many Diamond-created archives available on electronic bulletin boards or on-line services. The interface is simple and straightforward, and Diamond can create self-extracting compressed archives (adding about 35K to the compressed file in the process). Version 5.3 reviewed. $75. Sextant Corp., 1501 Laurel St., Sarasota, FL 34236. (813) 954-5622. (Apr '91)

DIRectory ↕↕↕↕½

DIRectory is a fast, excellent file-cataloging tool. Easy-to-use Finder-like interface. Good printed reports. Includes actual icons and version numbers and a DA that can find files on your disks and in DIRectory catalogs. Version 4.0 shipping. $94. Seagull Engineering, Box 909, S-220 09, Lund, Sweden. 011-46-46-12-54-64. (Sept '90)

Disk Ranger ↕↕↕↕

Disk Ranger is primarily a file-cataloging program. It has superb filtering abilities, useful sorting options, and good report-printing capability, and it works quickly. Comes with a DA that reads catalog files created by the program; also searches effectively for files. Disk Ranger prints decent labels, on ImageWriters only. Can also defragment files of a user-specified size. Disk optimization is adequate. Version 1.0 reviewed. Version 4.6.3 shipping. Requires Mac 512Ke or later. $59.95. Graham Software Co., 8609 Ingalls Cir., Arvada, CO 80003. (303) 422-0757. (July '90)

DiskDoubler ↕↕↕↕

DiskDoubler consists of an INIT and an application for file compression and expansion. The INIT provides a simple interface, adding a pull-down menu to the Finder and all your applications. You rarely need to access the application directly. Quick and efficient for compression. Can't decompress individual files. Other utilities such as StuffIt or Compactor are better for archiving applications. Version 3.0.1 reviewed. Version 3.7 shipping. Requires Mac Plus or later and System 6.0.3 or later. $79. Salient Software, 124 University Ave. #103, Palo Alto, CA 94301. (415) 852-9567. (Apr '91)

DiskExpress II ↕↕↕↕↕

DiskExpress II is much quicker and better than the original DiskExpress. One of the best hard-disk optimizers (or defragmenters) available, it can run automatically in the background, at a preset time or manually. It's capable of several levels of optimization. When used judiciously, does a perfect job. Version 2.04 shipping. Requires System 6.0.3 or later. $89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383. (713) 353-4090. (July '90)

DiskTop ↕↕↕↕↕

DiskTop is the quintessential Finder-replacement DA. It's easy to use, is powerful, and has an excellent interface. Launches applications and performs batch copies and moves. It's very fast, and the Find function's multiple options are unmatched. Version 4.0 reviewed. Version 4.01 shipping. Requires Mac 512Ke or later. $99.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (June '90)

FetchIT ↕↕↕↕½

FetchIT is an INIT that puts a pop-up menu on the right side of the small-icon and disk-name dialog boxes. This menu can be used to navigate your mounted drives or do other Finder-type operations. Performance is good. Excellent search capabilities. Version 2.01 reviewed. Version 2.2 shipping. Requires Mac Plus or later and System 6.0.3 or later. $25. CRA Z Software, P.O. Box 6379, Haverhill, MA 01831. (508) 521-5262. (June '90)

File Director ↕↕↕↕↕

File Director is an extremely easy-to-use, versatile, and powerful collection of utilities. It includes Disk Tools (for file management and searching), File Director (an application launcher formerly called PowerStation), Calendar (a basic monthly appointment and phone-number manager that attaches notes to entries), Phone Pad (a combination notepad and phone dialer), and RPN Calculator and Scientific Calculator (two sophisticated improvements on Apple's Calculator DA). This package is a winner, especially if your hard-disk drives contain many different files and applications. Requires Mac Plus or later. $129. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Apr '91)

Findswell ↕↕↕↕↕

Findswell is an indispensable utility that installs a new button in the Open dialog box of every Mac application. Click on the button, type a search string, and click on Find, and Findswell searches for any files that match. Version 2.01 shipping. Requires Mac 512Ke or later. $59.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Nov '87) ★'87 Eddy

INITPicker ↕↕↕↕½

INITPicker is a control panel that offers a scrollable list of INITs in the system so you can determine their loading order. Holding down a predetermined key combination at startup automatically shuts off all INITs and bypasses the INITPicker screen. Can be invoked at startup. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $69. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Aug '89)

KiwiFinder Extender ↕↕↕↕

KiwiFinder Extender lets you manage, sort, and search through large numbers of files, using a simple application called Manager. The application maintains a database about all the files on your hard-disk drive. KiwiFinder adds buttons to the Mac's standard Open and Save dialog boxes, providing many of the options available with the Manager application. For users with reasonably organized hard drives, this package isn't necessary, but it can aid those who need help with large-scale file management. Version 1.0.2 reviewed. $99. Kiwi Software, 6546 Pardall Rd., Santa Barbara, CA 93117. (800) 321-5494 or (805) 685-4031. (Apr '91)

MacTools Deluxe ↕↕↕½

MacTools Deluxe contains utilities that include a disk optimizer, a backup program, security options, partitioning software, search/launch capabilities, and a code-manipulation program called FileEdit. MacTools Deluxe has mediocre performance as a file-recovery package — unless it is preinstalled as a preventive system, in which case it has good panic performance and recovers deleted or erased files well. Version 1.2 shipping. $129. Central Point Software, Inc., 15220 N.W. Greenbrier Pkwy. #200, Beaverton, OR 97006. (800) 888-8199 or (503) 690-8090. (Apr '91)

MultiDisk ↕↕↕↕

MultiDisk is an excellent software disk partitioner that allows partitions to be dynamically resized, password-protected, and even encrypted. Can't erase partitions from the Finder. Version 1.11 reviewed. Version 1.2 shipping. Requires System 6.0.3 or later. $89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383. (713) 353-4090. (May '89)

Norton Utilities for the Macintosh ↕↕↕↕↕

The Norton Utilities package provides complete tools for protecting and restoring the data on your hard-disk drive. Utilities that optimize hard-drive performance and speed up searches for missing files are included as well as an application that modifies the appearance of Finder windows. Another useful software component is the KeyFinder DA, which simultaneously displays all available keyboard characters. This utilities package is highly recommended. Version 1.0 reviewed. Version 1.1 shipping. Mac Plus or later. $129. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Mar '91) ★'90 Eddy

On Cue ↕↕↕↕½

On Cue lets you switch applications without returning to the Finder. Under MultiFinder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.0 reviewed. Version 1.3 shipping. Requires Mac Plus or later. $59.95. ICOM Simulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090. (708) 520-4440. (Sept '88)

On Location ↕↕↕↕

On Location finds files and text strings. Once they've been found, you can view file contents (for most common document formats); open a file in its native application; or copy, delete, rename, or move a file. Main asset is blazing speed. Nonstandard interface. Has one-year, money-back guarantee. Version 1.0 reviewed. Version 1.0.2 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. $129.95. ON Technology, Inc., One Cambridge Center, Cambridge, MA 02142. (617) 225-2545. (Aug '90)

PickTure ↕↕↕↕½

PickTure is an INIT and control panel that serves as a visual file

selector. Presents rows of miniature screen shots of all files that a selected application can open. Double-clicking on the screen shots opens the desired file. Radio buttons customize navigation through folders. Version 1.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $89.95. Right Answers, Box 3699, Torrance, CA 90510. (213) 325-1311. (July '91)

POWERicons ⭐⭐⭐⭐

You can create duplicate application icons for simple and efficient hard-disk-drive organization with POWERicons. It can open sets of frequently used icons and print document batches. Easy and fast setup. Good manual. Version 2.0 shipping. Requires System 4.2 or later. $79.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Feb '90)

Shortcut ⭐⭐⭐⭐⭐

Created by Raymond Lau, Shortcut is an INIT that increases the functionality of Open and Save dialog boxes. It adds options for creating new folders, going directly to or getting information about any folder, opening any file, or unstuffing any StuffIt archive. Nearly flawless performance. Version 1.5 reviewed. Requires Mac Plus or later and System 6.0.2 or later. $79.95. Aladdin Systems, Inc., 165 Westridge Dr., Watsonville, CA 95076. (408) 761-6200. (Sept '91)

Silverlining ⭐⭐⭐⭐½

Silverlining is an advanced hard-disk-utility set. Excellent disk-partitioning software available. Formats most hard-disk drives. Powerful, safe optimizing and testing features. Excellent performance. Includes DS Backup (backup software) and a good disk duplicator. Version 5.27 shipping. Requires Mac Plus or later and a hard-disk drive. $99.95. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Jan '90)

StuffIt Classic ⭐⭐⭐⭐⭐

StuffIt Classic compresses files to reduce the amount of space they occupy on-disk. Great for transferring documents via modem. Also joins and encrypts files. Version 1.5 reviewed. Version 1.6 shipping. Requires Mac Plus or later and System 6.0.3 or later. Shareware, $25. Aladdin Systems, Inc., 165 Westridge Dr., Watsonville, CA 95076. (408) 761-6200. (Dec '88)

StuffIt Deluxe ⭐⭐⭐⭐½

StuffIt Deluxe is the commercial version of StuffIt Classic, a file-compression and archiving utility. This powerful version is quick and easy to use, and it provides nearly every feature needed for compressing files. Can create "self-extracting archives," which can be opened on a Mac that doesn't have the StuffIt Deluxe application. Includes security features, optional compression speeds, and a control panel for quick access. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $99.95. Aladdin Systems, 165 Westridge Dr., Watsonville, CA 95076. (408) 761-6200. (Sept '91)

SUM II (Symantec Utilities for Macintosh) ⭐⭐⭐⭐

SUM II is an upgraded, expanded version of the excellent SUM data-recovery package. Includes utilities for partitioning, encrypting, backing up, defragmenting, and optimizing floppies and hard-disk drives. Straightforward and reliable for defragmenting and optimizing, but less easy to use for undeleting files. Requires Macintosh Plus or later and System 6.0.3 or later. $149.95. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Dec '89) ★'88 Eddy

Super Boomerang ⭐⭐⭐⭐⭐

Super Boomerang is a handy INIT that adds full navigational and search features to all Open and Save dialog boxes. It automatically remembers all the files and folders recently accessed. Can be configured to always show certain files and folders. Big time saver. Version 2.0 shipping. Requires Mac Plus or later. With Now Utilities, $129; free upgrade from Boomerang. Now Software, Inc., 520 S.W. Harrison, Ste. 435, Portland, OR 97201. (800) 237-3611 or (503) 274-2800. (Apr '90)

PRINTING

BulkMailer+ ⭐⭐⭐½

BulkMailer+ is a basic mail manager with many powerful sorting features. Port setup can be difficult. Can handle up to 90,000 names and addresses. Skips records. Version 3.23 reviewed. Version 3.25 shipping. Requires Mac Plus or later. $350. Satori Software, 2815 Second Ave., Ste. 295, Seattle, WA 98121. (206) 443-0765. (Oct '89)

FastLabel ⭐⭐⭐⭐

FastLabel is a good label creator and printer. Excellent tools for designing labels. Can include graphics and icons. Prints envelopes by treating them as large labels. Weak list handling. Version 2.0 reviewed. Version 3.0 shipping. $79.95. Vertical Solutions, P.O. Box 1150, Beaverton, OR 97075. (800) 222-6032 or (503) 671-0790. (Oct '90)

Freedom of Press ⭐⭐⭐⭐⭐

Freedom of Press gives you PostScript-quality output on non-PostScript printers and is the best software-only PostScript clone available. The only limit to output quality is the printer's maximum resolution. Adobe Type 1 fonts and Adobe Type Manager are supported. Process is slow and creates large PostScript files, but output is nearly indistinguishable from true PostScript printer output. Background printing is possible running under MultiFinder. Some users would do just as well getting a PostScript cartridge for their printer. Version 3.0 reviewed. Requires Mac Plus or later with 2 MB of RAM, a hard-disk drive, and 1 MB of printer memory. $495. Custom Applications, Inc., 900 Technology Park Dr., Bldg. 8, Billerica, MA 01821. (508) 667-8585. (Feb '91) ★'89 Eddy

Freedom of Press Light ⭐⭐⭐⭐⭐

Although it supports fewer printers and comes with fewer fonts than the full-fledged Freedom of Press program, this Light version also lets you print PostScript-quality output on non-PostScript printers. The only limit to output quality is your printer's maximum resolution. Adobe Type 1 fonts and Adobe Type Manager are supported. Background printing is possible running under MultiFinder. Some users would do just as well getting a PostScript cartridge for their printer. Version 3.0 reviewed. Requires Mac Plus or later with 2 MB of RAM, 2.5 MB of available hard-disk space, and 1 MB of printer memory. $98. Custom Applications, Inc., 900 Technology Park Dr., Bldg. 8, Billerica, MA 01821. (508) 667-8585. (Feb '91)

Grappler Spooler ⭐⭐⭐

Grappler Spooler is an adequate spooler but no speed demon. Installation is simple, and there are few problems, but sometimes using it is slower than not using a spooler. Version 1.0 shipping. Requires Macintosh Plus or later, System 6.0.3 or later, and laser printer (hard-disk drive recommended). $79. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807. (714) 779-2772. (Apr '90)

JetLink Express ⭐⭐⭐⭐½

JetLink Express is a printer driver that lets you print to non-PostScript HP- and Canon-compatible printers. Provides TrueType scalable fonts that it uses automatically when you choose standard screen fonts. Check application compatibility before buying. Performance is good but sacrifices many features offered by a properly configured PostScript printer. Version 2.2 shipping. Requires Mac Plus or later, System 6.0.2 or later, hard-disk drive, and HP or Canon printer. With serial cable, $159; with parallel cable, $249. GDT Softworks, Inc., 4664 Lougheed Hwy., Ste. 188, Burnaby, British Columbia V5C 6B7, Canada. (800) 663-6222 or (604) 291-9121. (May '91)

KiwiEnvelopes! 3.1 ⭐⭐⭐⭐

This DA has simple features for one-shot envelope printing, but it needs font flexibility. Features include unlimited number of records, graphics capability, and postal-bar-code creation. Envelope sizes are limited. Has on-line help. Version 3.1 reviewed. $49.95. Kiwi Software, 6546 Pardall Rd., Santa Barbara, CA 93117. (800) 321-5494 or (805) 685-4031. (Apr '91)

MacEnvelope 5.0 ⭐⭐⭐⭐½

This combination DA/application has many powerful features for envelope printing and mail management, but it lacks font flexibility and unlimited-record capability. Features include graphics ability, postal-bar-code creation, data import/export, and print merge. You can customize envelope sizes, or you can use 11 predefined standard formats as well as 150 label templates. Sorts by name or ZIP code. Version 5.0 reviewed. Requires Mac Plus or later. $89.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (800) 447-9639 or (718) 499-6293. (Apr '91)

MacPrint ⭐⭐⭐⭐

MacPrint is a printer driver that lets you print to non-PostScript HP-compatible printers. Provides screen fonts for every HP font cartridge and special Compugraphic screen fonts. Includes cable. Good manual. Check application compatibility before buying. Version 1.23 shipping. Requires Mac Plus or later, System 6.0.2 or later, a hard-disk drive, and an HP-compatible printer. $149. Insight Development Corp., 2200 Powell St., Ste. 500, Emeryville, CA 94608. (415) 652-4115. (May '91)

PrintBar ⭐⭐⭐⭐½

PrintBar calculates and prints bar codes at varying resolutions. It supports UPC, EAN, Interleaved, 2 of 5, and Code 39. Operation is a bit clunky, but performance is fine. Output is easily transferable. Easy to use. Version 2.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. Nine volumes (for different codes), $95 to $295 each. Bear Rock Technologies, 6069 Enterprise Dr., Diamond Springs, CA 95619. (916) 622-4640. (June '90)

QuickEnvelope 1.0 ⭐⭐⭐

This DA has limited features and flexibility for envelope printing, with 1,000-record capacity. Features include full font control and print merge. You can customize envelope size or use two predefined standard formats. Without features such as graphics-importing and postal-bar-code capability, QuickEnvelope can't compete with similar envelope-printing utilities. Version 1.0 reviewed. $49. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '91)

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QuickLetter ⁂⁂⁂½
QuickLetter is a well-designed and thoughtfully implemented DA for creating letters and envelopes. Creates stationery, complete with graphics, and maintains an address book that includes salutations. Version 1.0 reviewed. Version 1.1.5 shipping. Requires Mac 512Ke or later. $124.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Apr '89)

SharpenUp ⁂⁂⁂½
SharpenUp is an INIT and control panel that automatically adjusts the relative width of lines, the texture of gray patterns, and the overall brightness on your laser printer. Has no effect on text or bit-mapped or EPS graphics. Can greatly improve the quality of lines in tables in Word 4.0 or of cell outlines in Excel. Comes with a nice set of predefined styles, and users can create custom styles easily. Version 1.0 shipping. Requires Mac Plus or later. $99. Somak Software, 535 Encinitas Blvd., Ste. 113, Encinitas, CA 92024. (800) 842-5020 or (619) 942-2556. (Sept '90)

SuperLaserSpool ⁂⁂⁂
SuperLaserSpool supports a wide range of printers, including the HP DeskWriter. Excellent performance. Installation is a snap, and use is mostly transparent. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and System 4.1 or later. $149.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Apr '90)

SuperSpool ⁂⁂½
SuperSpool is a simple ImageWriter print spooler. Often slightly quicker than SuperLaserSpool. No PostScript support. Version 5.0 reviewed. Requires Mac Plus or later, System 4.1 or later, and a QuickDraw printer. $99.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Apr '90)

TurboSpool ⁂½
This spooler has a nice interface but forces you to load spooled files into the queue manually. Sometimes printing delay is unnecessarily long. Compatible with LaserWriter and MultiFinder. $69. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (Apr '90)

UltraScript for the Macintosh ⁂⁂
UltraScript provides software-only PostScript emulation that lets Mac applications get the maximum quality possible from non-PostScript printers. A serious disadvantage is that Adobe Type 1 fonts must be converted into a proprietary format in order to work with UltraScript. Adobe Type Manager still works, but it doubles the hard-drive space used by fonts. Batch processing is not possible, and not all printers and film recorders are supported. Version 1.11 reviewed. Requires Mac Plus or later and at least 3 MB of RAM (hard drive recommended). $195; UltraScript Plus (includes network spooler and 43 fonts), $445. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (Feb '91)

● Security

A.M.E. (Access Managed Environment) ⁂½
This industrial-strength security system offers some of the most complete features available for the Mac, but its unforgiving approach makes it suitable only for knowledgeable users. System administrators will appreciate the Activities Log feature, which remembers any activity on the protected Mac. You can assign access levels for users, and password protection is sophisticated. DES encryption is available. A.M.E. is effective, but it is so sensitive to user error that the program can irretrievably lose data. Version 1.1.3 reviewed. Requires Mac Plus or later, System 6.0.2 or later, and hard-disk drive. $279; discounted site licenses available. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228. (May '91)

Advanced Security ⁂⁂⁂
Advanced Security consists of three applications: File Security, which can automatically protect your work; HD Security, which locks hard disks so they can be opened only by a special floppy; and Virus Security, which checks itself for changes when it's run. Version 1.2.2 shipping. Requires Macintosh Plus or later. Single-user version, $69.95; multiuser versions available. Advanced Gravis Computer Technology Ltd., 7400 MacPherson, Ste. 111, Burnaby, British Columbia V5J 5B6 Canada. (604) 434-7274. (May '90)

DiskLock ⁂⁂⁂½
The easy-to-use security program DiskLock keeps the contents of your hard-disk drive private. The important improvements in this version include the ability to do background processing, protection against the trashing of locked files and folders, and support for the U.S. Data Encryption Standard (a faster proprietary encryption is also provided). It doesn't offer customizable user levels, administrative functions, or a hierarchy of privileges, however. Like all security software, DiskLock works best for people who never forget their password. Version 2.0 reviewed. Requires Mac Plus or later and System 4.1 or later. $189. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Mar '91)

FileGuard ⁂⁂⁂⁂
FileGuard is an excellent security package that operates primarily in the background. It is unique in that it can protect folders, applications, and data files, which it accomplishes by using an easily updated list of persons who have different levels of access. There is no DES encryption, but its proprietary encryption is well done. FileGuard provides support for the optional MaccessCard magnetic-identity-card reader that operates as part of the ADB circuitry. Version 2.5 reviewed. Version 2.5.2 shipping. Requires Mac Plus or later; SE or later to use MaccessCard reader. $249; 5-user office pack, $595; 10-user office pack, $995. ASD Software, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '91)

Ft. Knox ⁂⁂⁂½
Ft. Knox is an excellent security utility. Supports two forms of encryption. Files or volumes can be "sanitized" to U.S. top-secret standards. Version 1.0.5 shipping. Requires Mac Plus or later. $195. Transfinite Systems, P.O. Box N, M.I.T. Branch Post Office, Cambridge, MA 02139. (617) 969-9570. (Nov '89)

MaccessCard Reader ⁂⁂⁂⁂
MaccessCard is a magnetic-identity-card reader that operates as part of the ADB circuitry and requires ASD's excellent FileGuard software. In conjunction with FileGuard, the reader prevents unauthorized access to either a Mac's entire hard disk or a specified selection of files, folders, applications, and partitions. Requires Mac SE or later, with FileGuard software. $349. ASD Software, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '91)

MacSafe ⁂⁂⁂
MacSafe is a data-file-security program that lets you put multiple files into a "safe," where you can protect them further through two types of encryption (including DES). Flexible and easy to use. Allows for installation on hard-disk drive. Version 1.0 reviewed. Version 2.0 shipping. Requires Macintosh 512Ke or later. $189.95. Kent Marsh Ltd., P.O. Box 460289, 1200 Post Oak Blvd., Ste. 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Mar '87)

NightWatch ⁂⁂⁂
NightWatch locks up your hard-disk drive by using a floppy startup disk that acts as a key. Type in the correct password, and access to the hard-disk drive is allowed. Version 1.02 reviewed. Version 1.03 shipping. Requires Mac 512Ke or later and hard-disk drive. $149.95. Kent Marsh Ltd., P.O. Box 460289, 1200 Post Oak Blvd., Ste. 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Sept '88)

Rival ⁂⁂⁂⁂⁂
Rival is an INIT that inspects open files for known viruses. Rival checks files constantly, but delays are hardly noticeable. Also scans disks and does some file repairs. Experienced users can easily add protection against newly discovered viruses. Version 1.1.6 shipping. $99. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Sept '90)

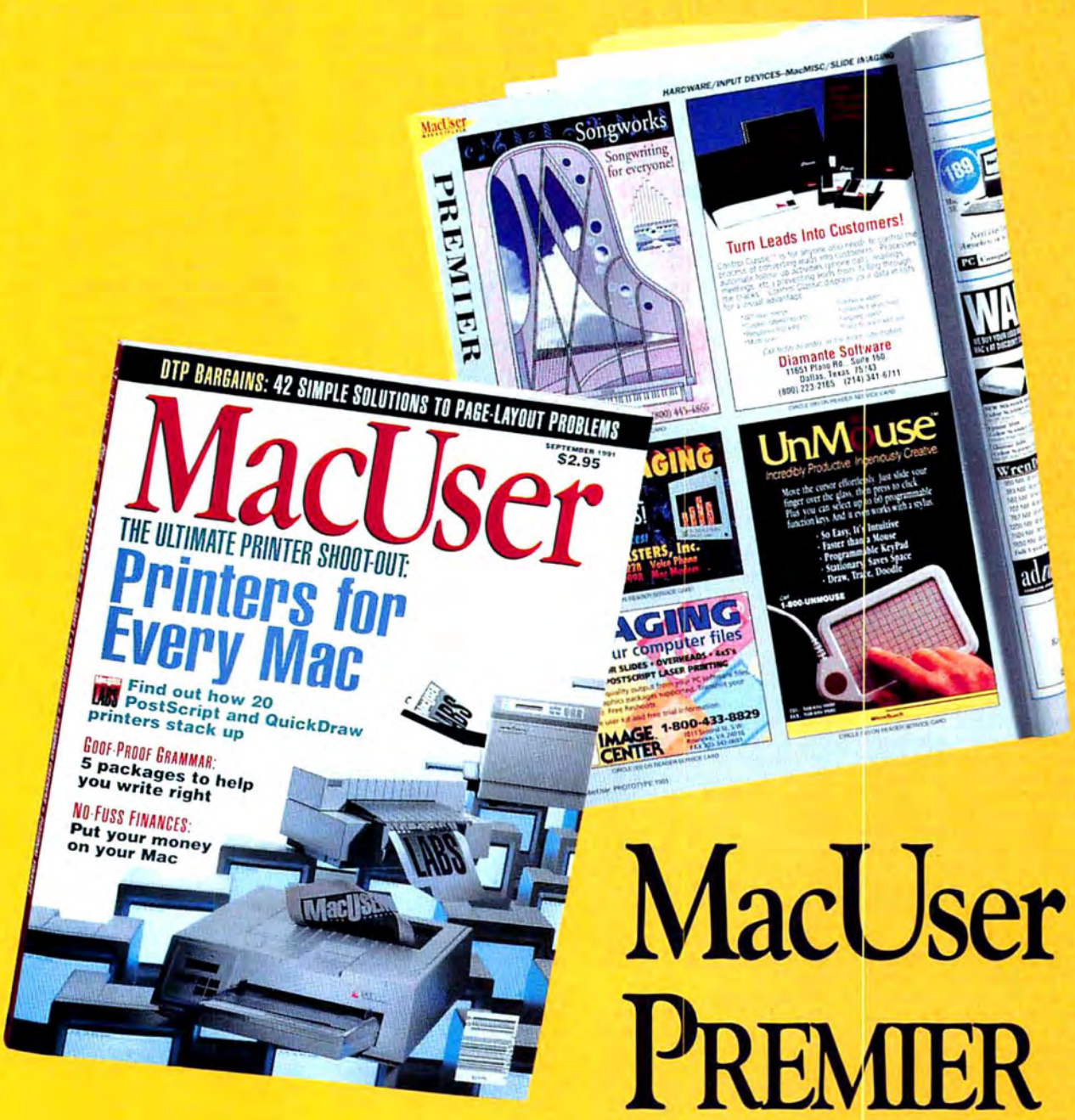
SAM (Symantec AntiVirus for Macintosh) ⁂⁂⁂⁂⁂
SAM is a powerful, effective virus detection and eradication program. One unique feature is the ability to monitor files while code resources are added. Good support and update history: Toll-free number is available for update information. Easy to use and easily modified for special needs. Allows networked users to access single virus-definitions file on central server. System-7-compatible with balloon help, ability to scan DAs at launch, and support for Apple events. Version 3.0 reviewed. Requires Mac 512Ke or later and System 6.0.3 or later. $99. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Aug '91) ★'89 Eddy

SecureInit ⁂⁂⁂⁂
SecureInit locks files and folders, makes the System Folder invisible, erases files not on its user-specified approved list, locks disks after use, refreshes (replaces) specified files with clean copies after use, and password-protects everything. Also purges files as a disk fills up, but this feature is too dangerous to use in many cases. Particularly good at resisting efforts to bypass it. Version 2.3 shipping. Requires Mac Plus or later. $99.95. Direct Software, Inc., 1032 Irving St., Ste. 513, San Francisco, CA 94122. (415) 347-1590. (Aug '90)

Virex ⁂⁂⁂⁂½
Virex is a virus detector and eradicator program. Excellent support and update history. Simple installation. The new AppleShare Installer is designed for use on an AppleShare file server. System 7 support is limited to balloon help. Version 3.2 reviewed. Requires Mac Plus or later and System 4.2 or later. $99.95; 10-user pack, $599; AppleShare Installer, free to users with site licenses or 10-packs. Microcom, Inc., 500 River Ridge Dr., Norwood, MA 02062. (800) 822-8224 or (617) 551-1000. (Aug '91)

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320mb	4385	5.25"	11ms	$1285	$1385
425mb	1480	3.50"	12ms	$1375	$1435
645mb	4767	5.25"	11ms	$1795	$1895
1.20gb	1200	5.25"	15ms	$2099	$2199
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Seagate hard drives carry a **ONE** year warranty. Internals include a mounting kit and cables. Externals include all cables needed for installation. FIVE year warranty available!

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$2099

Maxtor 1.0GIG Panther Internal

$1995

Maxtor®

Capacity	Model	Size	Access	Internal	External
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120mb	7120	3.50"	13ms	$375	$435
213mb	213	3.50"	13ms	$599	$659
340mb	340	3.50"	11ms	$985	$1045
760mb	8760	5.25"	16ms	$1449	$1549
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Maxtor hard drives carry a **TWO** year warranty. Internals include a mounting kit and cables. Externals include all cables needed for installation.

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635mb	97548	5.25"	17ms	$1619	$1719
1.0gb	97549	5.25"	17ms	$2289	$2389
1.0gb	97558	5.25"	13ms	$2519	$2619
1.4gb	97560	5.25"	13ms	$2749	$2849

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SyQuest

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44mb	44mb cartridges	$69
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88mb x 2	Dual removable drives	$1429
88mb	88mb cartridges	$119
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*Includes 44 & 88 cartridges

Syquest hard drives carry a **TWO** year warranty. Cartridges carry a **ONE** year warranty. All drives include **ONE** cartridge, cables and software.

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Manufacturer	Capacity / type	Price
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TEAC	155mb	$579
TEAC	600mb	$799
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1. Please indicate which of the following computers you currently use in your company or organization: (check all that apply)

- ☐ a) Mac Plus
- ☐ b) Mac SE
- ☐ c) Mac II
- ☐ d) IBM PC
- ☐ e) Other

2. For how many micro computers do you buy products?

- ☐ f) 1-4
- ☐ g) 5-49
- ☐ h) 50+

3. Your primary job function is: (check one)

- ☐ i) Administrative/General Management
- ☐ j) MIS/DP, Communications Systems, Programming
- ☐ k) Engineering/R&D
- ☐ l) Finance/Accounting
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4. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (Check all that apply)

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- ☐ o) Accounting
- ☐ p) Spreadsheets/ Financial Planners
- ☐ q) Project Managers
- ☐ r) Word Processors
- ☐ s) Database Managers
- ☐ t) Graphics
- ☐ u) CAD/CAM
- ☐ v) Communications

HARDWARE
- ☐ w) Mainframe
- ☐ x) Mini
- ☐ y) PC
- ☐ z) Printers/Plotters
- ☐ 1) Monitors
- ☐ 2) Disk/Tape Back-up
- ☐ 3) Add-in Boards
- ☐ 4) Communications

5. Are you involved in the purchasing of microcomputer equipment at your company?

- ☐ 5) Yes
- ☐ 6) No

6. If so, what function do you serve in the buying process?

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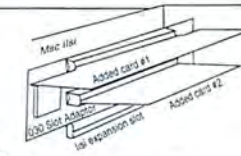
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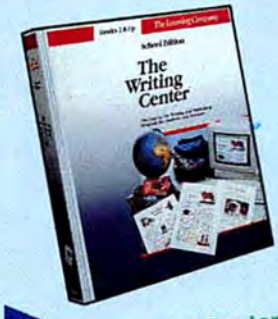
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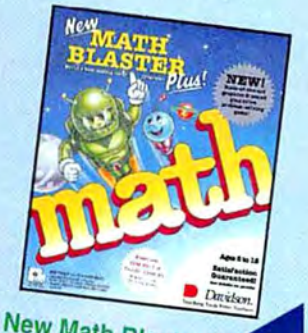
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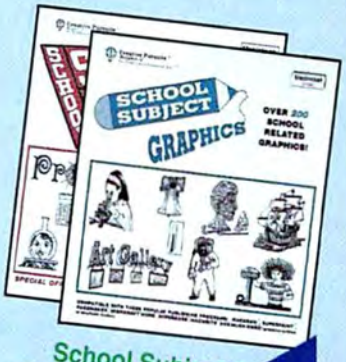
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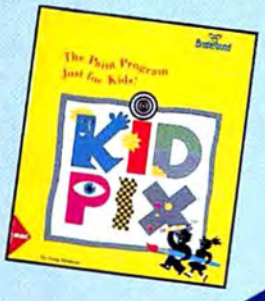
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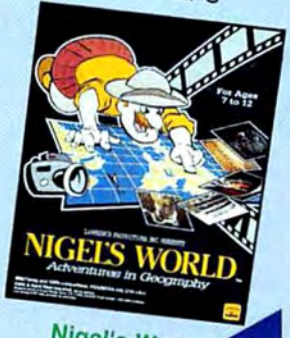
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Mac IIsi Starter Package $2999
3 Mb of RAM, 40 Mb internal hard disk, Apple standard keyboard, Mouse and an Apple 13" RGB Color monitor.

Mac IIsi Office Package $4438
5 Mb of RAM, 120 Mb internal hard disk, 40 Mb ETC External SCSI hard disk, mouse, microphone, Apple standard keyboard, Apple 13" RGB monitor, and Personal LaserWriter LS.

Mac IIci "24-bit" Package $5599
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Printers and More...

If you need it in print, the collection of printers we have to offer can't be beat in perfomance or price!

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Quantum, Maxtor and Connor drives are three of the best on the market. They are fast and reliable. All ETC internal drives come with brackets, cables and software.

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ETC 1.2 Gb Maxtor	$2149.00
ETC 1.6 Gb Maxtor	$2699.00
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ETC 337 Mb WREN-Runner-1, 10.7 ms	$1399.00
ETC 676 Mb WREN-5, 16.5 msec	$1599.00
ETC 676 Mb WREN-Runner-2, 12 ms	$1899.00
ETC 1.05 Gig WREN-7, 15msec	$2249.00
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And now during our "Winning Combination" laser printer rebate program (September 1, 1991 through January 5, 1992), when you purchase any of our PostScript printers including the BLP Elite, we'll send you a $100 rebate. And that's not all. We're also offering GCC Extended Care™ – our warranty extension program – on all our laser printers at half price during our printer promotion.

800-422-7777 for the BLP Elite.

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In Canada "The Winning Combination" Rebate Program begins October 1, 1991.

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80	Maxtor	17	$279	$339
105LPS	Quantum	16	$349	$399
210	Maxtor	15	$599	$679
210	Quantum	16	$629	$689
320FH	Maxtor	14	$999	$1049
320FH	Micropolis	14	NA	$1199
660FH	Micropolis	16	NA	$1599
1050FH	Micropolis	14	NA	$2299
1050FH	Seagate	14	NA	$2199
1500FH	Micropolis	14	NA	$2699

REMOVABLE HARD DISK

SyQuest 44Mb $449
25ms. Includes 45Mb cartridge. Extra Cartridge $79

SyQuest 88Mb $699
20ms. Includes 88Mb cartridge. Extra Cartridge $129

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CD/ROM $539
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TAPE BACKUP

1.3Gb 4mm DAT $1495
Includes Retrospect™ software, 1 cartridge & cables.

150Mb Teac $549
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Extra 150Mb Tape $49

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Fujitsu 3.5" Drives

		Internal	External
45 MB	3.5" Low Profile/Low Power3yr warr, 50,000MTBF	$228	$288
90 MB	3.5"3yr warr, 50,000 MTBF	$338	$398
135 MB	3.5"3yr warr, 50,000 MTBF	$418	$498
185 MB	3.5"3yr warr, 50,000 MTBF	$548	$598
330 MB	3.5" 5 yr warr., 200,000 MTBf*, 9ms Access	$1548	$1598
425 MB	3.5" 5 yr warr., 200,000 MTBf* 9ms Access	$1648	$1698
520 MB	3.5" 5 yr warr., 200,000 MTBf* 9ms Access	$1748	$1798

* Mean Time Between Failure is the average life expectancy of a drive.(In case of a 200,000 MBTF, this means a potential of **24 years** of 40 hour weeks, 52 weeks per year!)

All 3.5" Drives are available in zero footprint (including a 40watt power supply, and dual AC outlets), or micro cabinets as well as internal for all Mac's.

All 5.25" Drives are available in zero footprint external (including a 65 watt power supply, cables, and ext. terminators) or as internals for the Mac II, IIx, and IIfx.

Fujitsu 5.25" Drives

5 Year Warranty! 200,000 Hours MTBF!*

		Internal	External
357 MB	5.25" Full Hght 16ms	$1198	$1298
680 MB	5.25" Full Hght 16ms	$1448	$1548
1.2 Gig	5.25" Full Hght 1.5ms	$2498	$2598

* Mean Time Between Failure is the average life expectancy of a drive. 24 hour factory replacement available for 5.25" drives for additional fee.

Archive DAT Tape Backup

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Up to 10 mb per minute backup time
Includes SoftBackup II for Fast network and unattended backup capabilities

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- Both Drives include Cartridge
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- SCSI Select and 2 Year Warranty



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00 MB Optical..... $2698

Read/write reliable storage
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Great for archiving, color scans etc.

Fujitsu 1.2 Gig Drive

	Internal	External
1.2 Gig H/D	$2498	$2598

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- 5 year warranty
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JX-9500PS Sharp Printer 35 Fonts

JX-9500PS 35 Fonts..... $1648.00

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- Adobe Postscript
- MacUser #1 printer 4.5 mice rating
- 35 Fonts, 6 page per minute
- Letter, legal and transperancies
- Includes Appletalk interface!
- Sharp is the manufacturer of the TI Microlaser, this is the same printer, but with 2.5mb!

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These drives retail for $259!

Fujitsu 800k
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170 MB 3.5"	$688	$758
210 MB 3.5"	$748	$848
ren 337 MB RUNNER	$1398	$1498
ren 600 MB F/H	$1598	$1698
ren 630 MB RUNNER II	$1998	$2098
ren 1.2 Gig	$2298	$2398

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DM-2060.....National Semiconducter 24Bit...$2098
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19" Trinitron Color System$2398
Ikegami CT-20...National Semiconducter 24Bit...$3198
14" NEC Color System.....$458

The NEC MacSync is plug compable with IIsi, CI and LC
All monitor systems except NEC include interface board and cable.



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NEW!

88mb Removable* $699



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Single Cartridge	$69
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Ten Pak—Each	$64

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QMS-PS®410 2 Megabyte	$250
QMS-PS®410 4 Megabyte	$400
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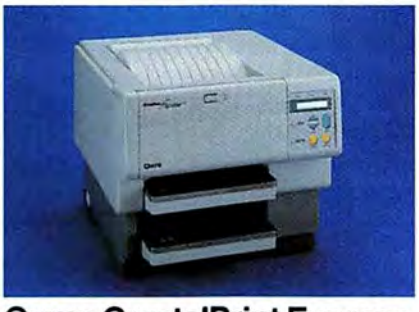
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VisionPro graphic cards are manufactured under license for MacTel. Our SP and SPS cards support multiple monitors, block mode transfer & acceleration, pan/zoom 2x & 4x and virtual desktop. With our monitors, they are an outstanding color solution.

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- 24-bit SPS card, 19" Sony Triniton (GDM-1950).....$3997
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Color Scanner

- VisionPro C300, 300 dpi, 8½ x 11" w/ ***Adobe Photoshop***$1199





Storage Solutions

MacTel offers you a number of storage and backup solutions, including a complete line of Index hard drives. *MacUser* Labs has rated the MacTel 45R drive (8/91) and the Index 1.2 Gb drive (7/91) 4 mice.

Removable - Optical - Tape

The Index HD formatter is System 7 compatible and supports partitioning, password protection and is A/UX compatible.

- **Index 45R** w/1 cartridge$479
- Index 88R w/1 cartridge$999
 Index 45R and 88R are bundled with ***Backmatic***® and ***AutoSave***®
- SyQuest cartridge SQ 400.....$69
- SyQuest cartridge SQ 800.....$149
- 2 GB DAT drive w/***Retrospect*** software and 1 tape$1799

NEW
- 1 GB Tahiti optical drive w/1 cartridge$3699

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	Internal	External
• 52 Mb, 12 ms, Slimline	$249	$329
• 105 Mb, 12 ms, Slimline	$389	$469
• 210 Mb, 12 ms	$699	$779
• 425 Mb, 12 ms	$1599	$1679

Imprimis drives Index 5.25"

• 320 Mb, 16ms	$1179*	$1279
• 330 Mb, 10.7 ms (Runner)	$1299*	$1399
• 640 Mb, 16 ms	$1499*	$1599
• 650 Mb, 10.7 ms (Runner)	$1899*	$1999
• 1.2 Gb, 16 ms	$2299*	$2399

*Mac II and IIx only

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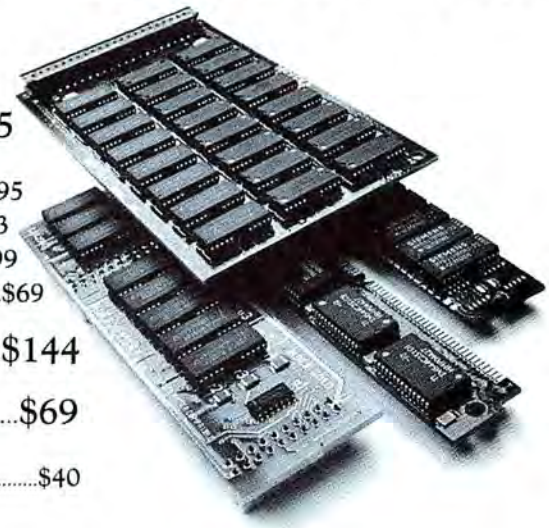
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- 1 Mb x 9 SIMM, 70/80 ns.....$43
- 3 Mb Classic memory.....$99
- Mac LC V-RAM upgrade.....$69
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- 1 Mb TI microLaser PS 17/35 & XL upgrade.....$69
- ***Maxima*** virtual memory managment software.....$40



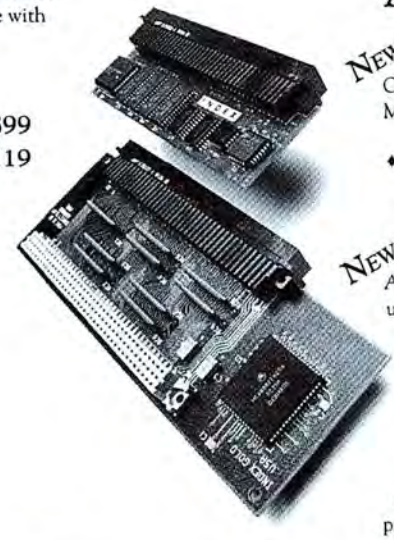
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MacTel's Index line of ADB extended keyboards have an 105-key layout, 15 function keys, cursor control keys and number pad. The French, German and Swiss keyboards come with system software.

Index extended keyboard

- English.....$99
- French, German, Swiss.....$119





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NEW

On-board 68882/20 MHz math co-processor with adaptor for Macintosh IIsi. Free performance evaluation software included.

- **Index Mac IIsi 030 Direct Slot Interface**.....**$99.00**

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Accelerate math-intensive operations on your LC operations by up to 39% with a 68882/16 MHz math co-processor —and get a 15% overall CPU improvement. ***Benchmark*** software included.

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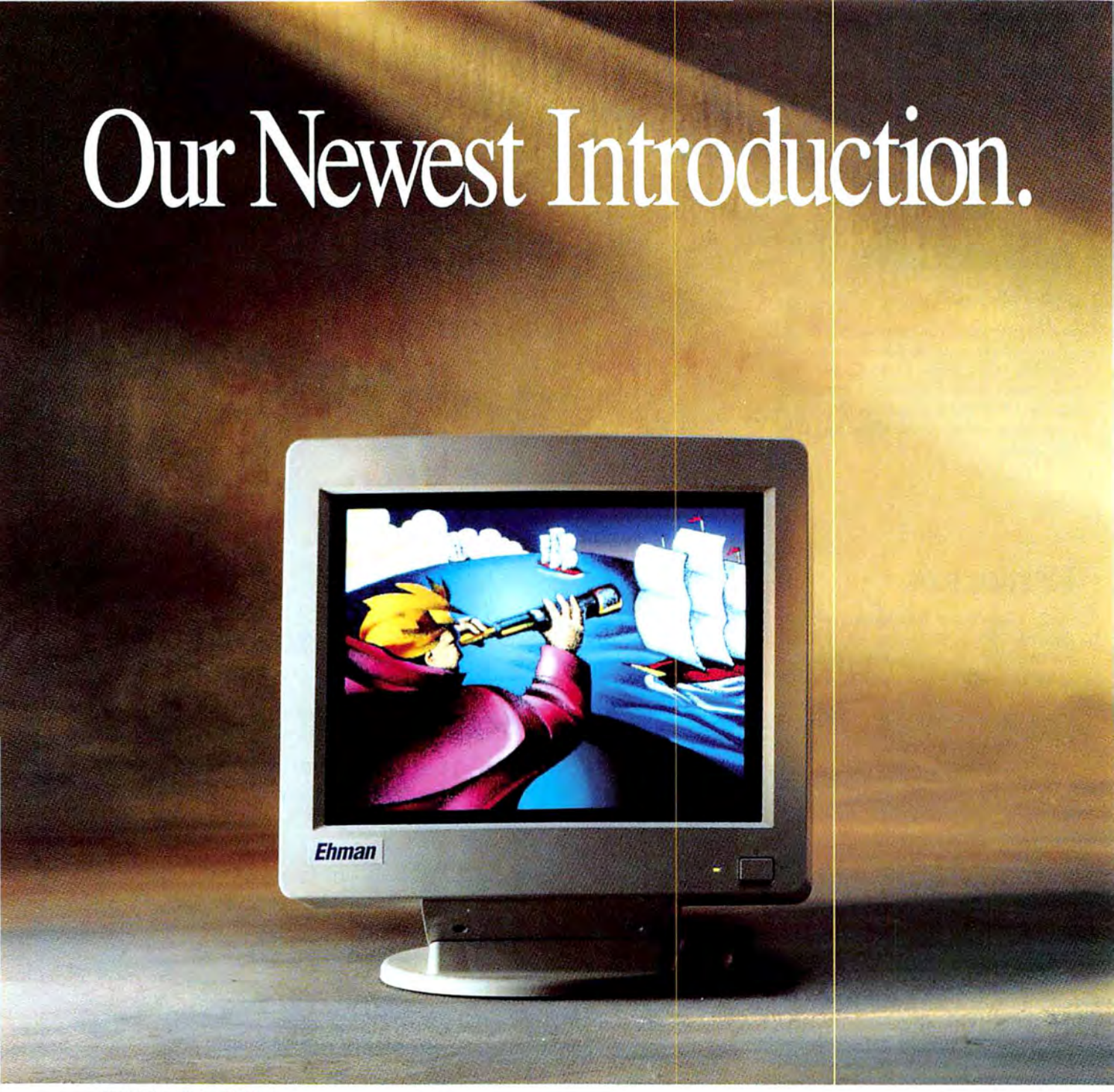
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Color monitor illustration by Rob Mageira

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Now allow us to introduce the newest member of our family; 20 inches of 8-bit and 24-bit color in high quality, 72 DPI monitors that end users will love, and budget watchers will adore.



All hard drives come bundled with your choice from two utility software packages and a 2-year warranty.

*Disk Doubler not available with 45MB removable

The new Ehman 2-page color monitors are as affordable as they are practical. Backed up by a one year warranty and our 30 day money back guarantee, the price tags once again demonstrate Ehman's commitment to value on the most popular peripherals.

The other members of the family are just as cost conscious. From the lightning fast "highly recommended" 660MB drive (*Macworld*, July 91)

No Introduction Needed.

"At $899, Ehman's Two-Page Monochrome display is an excellent buy."

MACWORLD, MAY, 1991

"If you want a full-page display, we recommend the Ehman: it's rare to find such high quality and low price ($499) in the same monitor."

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(MB)	800 K	20+	30+	40 EXT	52Q LPS	60+	80+	105Q LPS	170Q	207MX	332W H/H	660WR F/H	45MB
Internal	Floppy Drive	$225	$245	$249	$309	$285	$335	$479	$729	$699	$1,245	$1,949	Removable
External	$129	$269	$289		$359	$319	$379	$529	$789	$749	$1,289	$1,999	$489
Color 20" Monitor 8-Bit $2,895 24-Bit $3,895					Monochrome/Gray Scale 19" Monitor Monochrome $895 Gray Scale $1,495					Monochrome 15" Monitor $495			

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Best of all, the time-saving features of PostScript® Level 2 are available RIGHT NOW in our RealTech Laser and RealTech Laser 400:

• **IMPROVED MEMORY MANAGEMENT.** One pool of memory (RAM and hard drive) is available for all resource needs. Dynamically allocated and automatically reclaimed; no arbitrary memory restrictions exist. Disk space management is improved to eliminate fragmentation and improve transfers of information from the hard disk to RAM.

• **ATM FONT RENDERING TECHNOLOGY.** Raw characters are built 4 to 5 times faster.

Features available through software applications:

• **COMPRESSION.** Reduce transmission time and save disk space by sending compressed files directly to your printer.

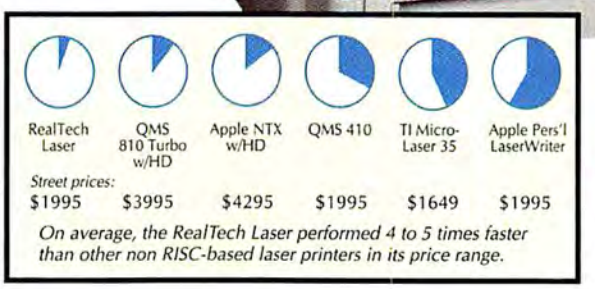
• **FORMS SUPPORT.** You can define a base form whose representation stays cached in the printer. Then only the information that changes between forms needs to be interpreted.

• **COMPOSITE FONTS.** Provides the capability to handle very large character sets and non-horizontal writing modes."

Réal Provencher, President
Software & Hardware That Fits

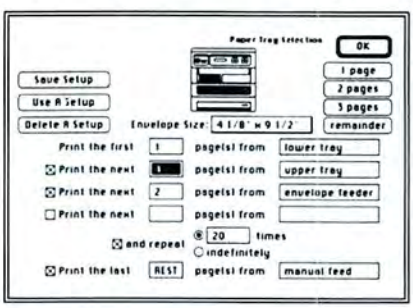
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• 2 paper trays



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3. ***What are its memory capabilities?***

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- **8 ppm (11x17)**
- **16 ppm (letter)**
- **RISC processor**
- **2 printer trays**
- **20,000 pages per month duty cycle**

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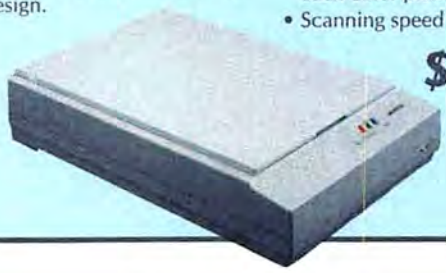
- Priced LESS than the comparable Apple product.
- Backed by our famous MONEY-BACK GUARANTEE and a minimum one-year warranty. *If you're not satisfied with what you buy from us, just call. We'll refund your purchase price (minus consumables, for printers).*

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Scanmaker 600ZS Color Scanner includes Adobe Photoshop – full version, with 24-bit color editing and color separation capabilities.

High-resolution color scanner capable of scanning 16 million colors at up to 600 dots per inch. Outstanding image quality in a compact, flatbed design.

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CPU	Monitor	Price
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Mac II, IIcx, IIci, IIx, IIfx	Mono	$995
Mac II, IIcx, IIci, IIx, IIfx	GS 256	$1479
Mac IIsi	Mono	$1059
Mac Portable	Mono	$1249



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Master's	16 million	$3195



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- Vertical refresh rate of 74 Hz
- Full grayscale capability
- Flat CRT, P4 phosphorus, polished screen
- One-year warranty

CPU	Monitor	Price
Mac II, IIcx, IIci, IIx, IIfx, SE, SE/30	Mono	$579
Mac II, IIcx, IIci IIx, IIfx	GS 256	$1079
Mac IIsi, IIci	GS 16	$495
Mac Portable	Mono	$849

1-800-972-3018

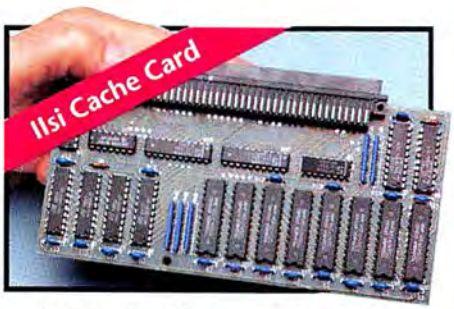
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Several members of our management team (left to right): Barbara, Jim, Lew, Réal.

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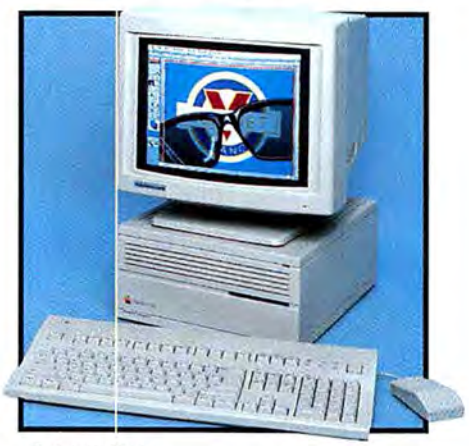
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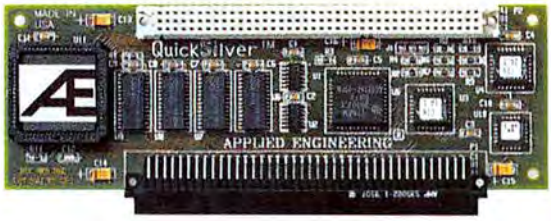
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Ili-1000	15.0	1.4	2929
Ili-1350	15.0	1.4	3519
Ili-644NP	11.9	3.0	2609
Ili-1000NP	15.0	2.5	3279
Ili-1350NP	15.0	3.2	3869
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Star Controller EN.....1709

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Data Club, 3 User.....215
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QuickMail, 10 User.....335
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VENTANA PRESS
- SYSTEM 7 BOOK 19

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SHARP
- EBR-9600 BAUD MODEM W/MNP5 279

SHIVA
- ETHERGATE 289
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Storage

CHINON
- CDC-431 CD ROM REMOTE DRIVE 585



CHINON
CDC 431 w/REMOTE $585

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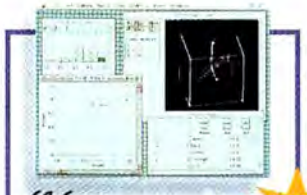
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UMAX
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CANVAS 3.0 Deneba

System 7 savvy, Canvas 3.0 supports Publish and Subscribe, Balloon Help, True Type, and custom Apple Events. Additionally the program offers professional text handling features like character-by-character font scaling, font conversion to Bezier curves, and text wraps inside or outside any shape. Users can blend objects from one shape to another, split or combine objects, simultaneously edit multiple Bezier curve anchor points, or add PMS colors. Canvas 3.0's standard import/export file translators include EPSF, Illustrator 1.1 and 88, CGM, DXF, IGES, PICT1/2, TIFF, MacPaint, StartUpScreen and MacDraw I & II (read only) formats.

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- DISPLAY ADS/FLYERS 109

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- COLORSTUDIO 599
- IMAGESTUDIO 138

MICROFRONTEIR
- ENHANCE 199

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- MACPALLETTE II 55
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MONOTYPE
- TRUETYPE IMPRINTS 21
- DESIGNING REPORTS & Presentations 115

MOTION WORKS
- ADDMOTION 177

MULTI AD SERVICES
- MULTI-AD CREATOR 498



WORDSTAR.
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Correct Grammar for the Macintosh identifies errors in grammar, style, usage, punctuation--even spelling with its 135,000 word dictionary. You can customize Correct Grammar to respect your personal writing style or compare the readability of your writing by sentence, to the education level of your intended audience.

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- PICTUREPRESS 119

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- MARIAH 89

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- OASIS 525
- W/WACOM TABLET 945

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- TIMBUKTU 4.0 133
- TIMBUKTU REMOTE 2.0 133

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Monotype's Imprints are a range of single typeface packages offering Macintosh users the only selection of foundry quality type in single typeface packages. These popular headline and presentation typefaces are sold individually, so you only pay for the typefaces you want.

$21

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- TURBOSTAR 869

SITKA
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STRATA 3D V2.0

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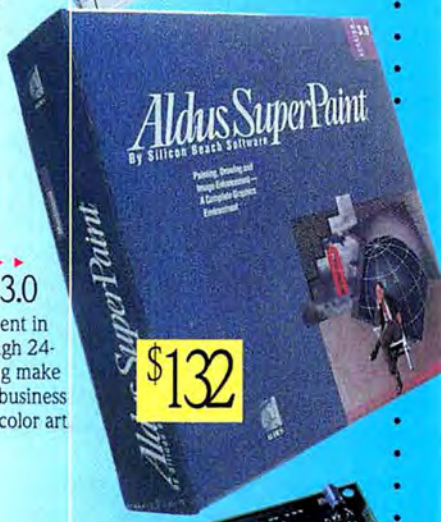
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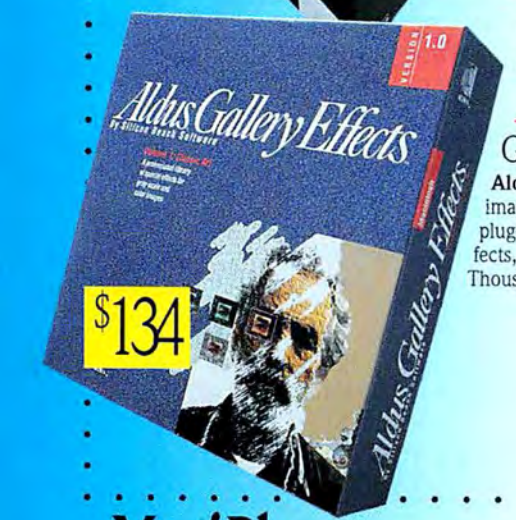
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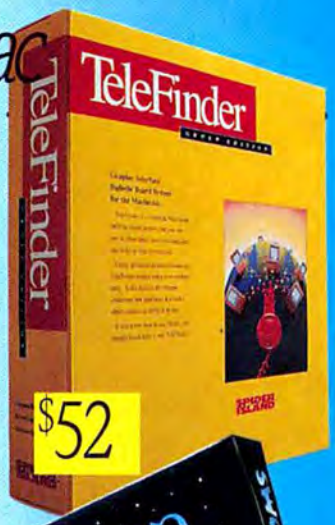
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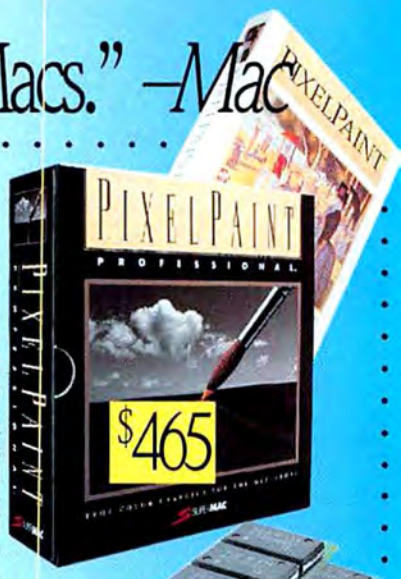
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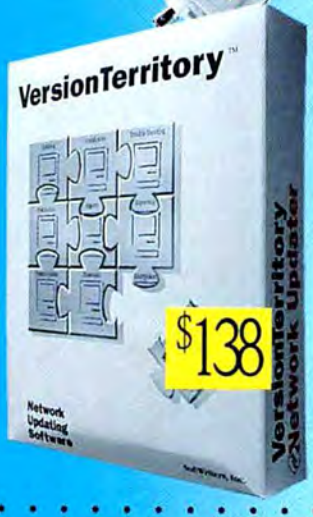
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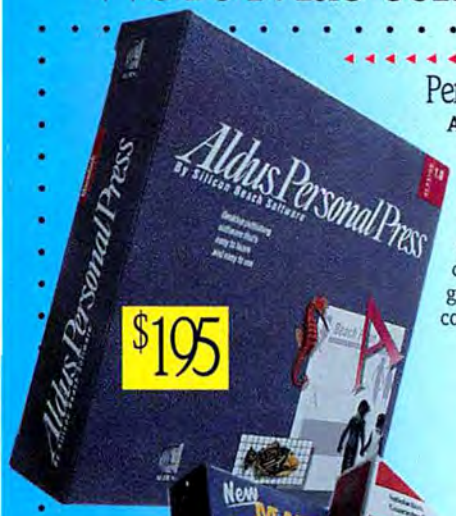
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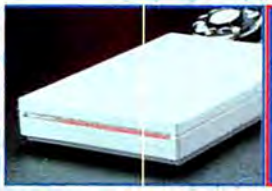
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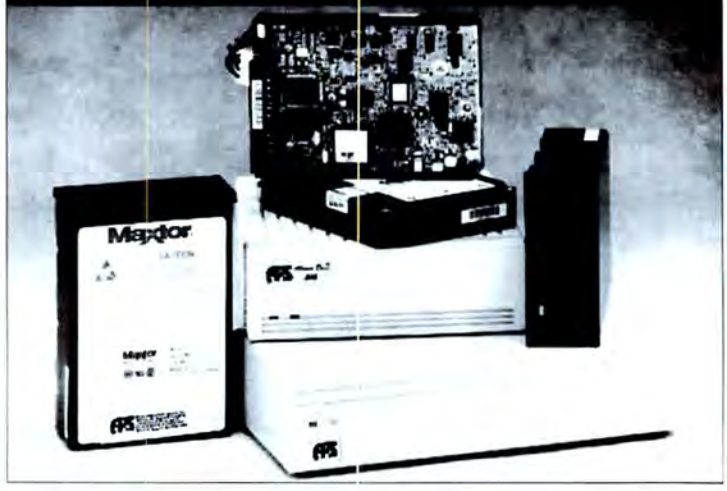
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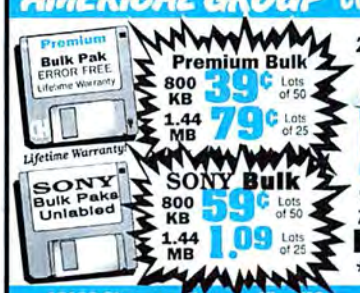
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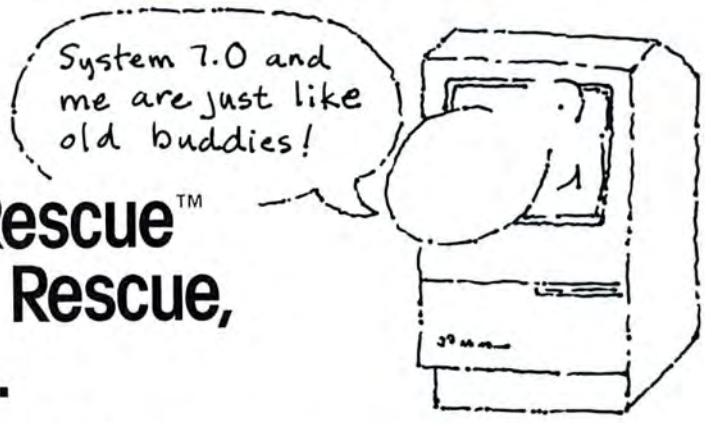
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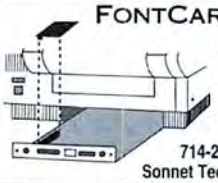
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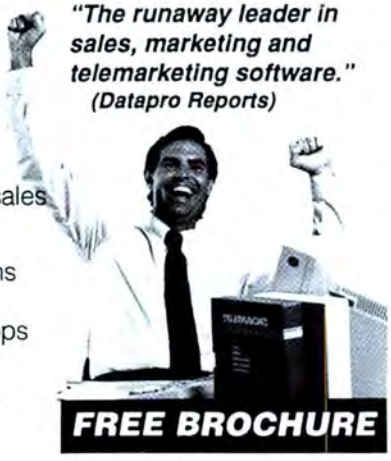
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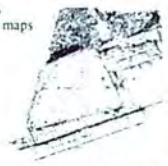
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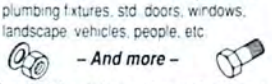
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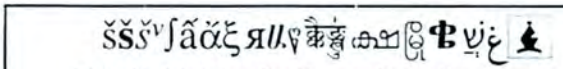
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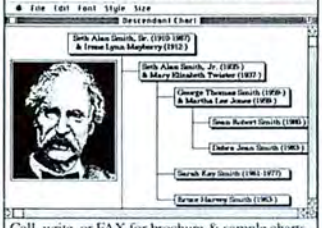
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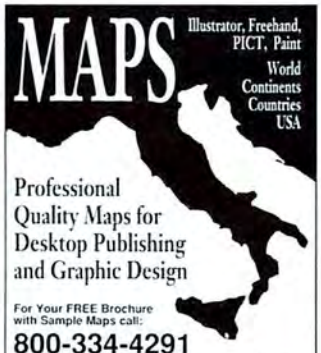
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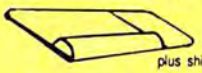
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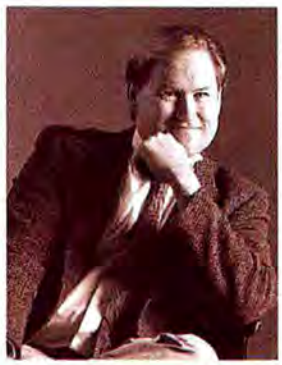
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JOHN C. DVORAK

Big Blue, Big Lemon



What has 400,000 employees but not a single good programmer? The company that's about to swallow Apple whole.



A lot of bogus theories are floating around concerning the IBM/Apple association. I'm sure I propagated a few of them myself. This isn't one of them. This column is the final analysis — the real bad news. It looks as though Apple is about to be owned by IBM — the enemy.

On the surface, it seems that IBM Entry System veep, James Cannavino, and Apple's answer to a James Bond villain, Mike Spindler, hooked up the two companies after a series of clandestine meetings all around the country. They agreed to join forces to create a new open platform to be shared by the whole world and to be managed by a third company — an Apple/IBM joint venture. Apple coughs up its portable version of its next operating system — the so-called Pink project. IBM delivers to Apple the RS/6000 RISC chip and little else.

Looking at this deal, you have to wonder *exactly what* did IBM toss into the pot besides its smile and a hearty handshake. If IBM is licensing the RS/6000 chip to Motorola so that everyone can buy it from Motorola, then why is Apple giving away its proprietary operating system? There is some talk that this will be sold to the whole world too. Why doesn't Apple just open its architecture, and why doesn't IBM simply do a deal with Motorola? Apple can buy chips from Motorola, and IBM can buy the operating system from Apple. What's the point of the joint venture and all these secret meetings? The point is that this is a smoke screen for the real reasons behind the powwows: a planned takeover of Apple by IBM.

The litany, according to Valley gossip, has it that ever since John Sculley ran into IBM CEO John Akers more than a year ago at some muckamuck event, Sculley has been selling Akers on the idea of taking over Apple. From Sculley's perspective, this kind of a deal makes good sense, and from IBM's perspective it's a great idea.

Let's start by looking at Sculley. This guy has got to be bored by now. He's made plenty of money and made his point about how to run Apple. He no longer has anything to prove, and he'd rather raise horses, write books, and live the contemplative life. It's doubtful that anyone else can run the company. Besides, there's nothing exciting going on at Apple. Apple has become a big, successful company selling (dare I say it?) a niche machine. Just as the Amiga has become the choice of videophiles with its NTSC and genlock capabilities, the Mac is the ultimate inexpensive desktop-publishing workstation. Unfortunately, the Mac is under attack by the new workstation revolution, with machines such as the Silicon Graphics Indigo and the IBM RS/6000 — not to mention the continuing threat of the inferior but cheap PC clones running Windows.

To make up for attacks on the profitable high end, Apple resorted to rolling out the Mac Classic. If it were a car, it would be called a gutless wonder. Worse than its mediocre performance is its thin profit margin for Apple. None of this looks good for the bottom line, and something needs to be done before anyone discovers that Apple is about to drive head first into the brick wall of no growth.

Enter the rubes from IBM.

Poor IBM can't even manage to find a few good coders among its 400,000 employees. Still licensing MS-DOS after a decade, IBM is sick of its inability to produce an operating system for its small computers. It's promising a super-duper version of OS/2 that will, according to IBM advertising, "run DOS programs better than DOS" and "run Windows programs better than Windows." As far as I can tell, it currently can't run anything.

IBM wants to retake a leadership role and sees that the future is in the next generation of desktop machine. These products look as if they will be RISC-based color graphics machines that can be interconnected — what have been dubbed workstations. But IBM doesn't want them to be running the jinxed UNIX or anything Microsoft will be selling to IBM's competition. This includes OS/2. (IBM will continue to reluctantly develop OS/2 as an interim OS, in case this deal with Apple falls apart.) If Apple can deliver a Mac operating system for the RS/6000, then IBM will be back in the driver's seat. Compared with the pathetic competition, the Mac operating system is a jewel.

Apple, of course, will then be completely absorbed into IBM and will eventually disappear. Within a year or two, the Mac OS will be remade by IBMers and will eventually become one large mess. Within a few more years, the IBM/Mac will be dropped. The story will be over. Perhaps by the year 2000, when you refer to Apple Computer, people will ask, "Apple Computer? What's that?" You'll mumble to yourself that it was fun while it lasted.

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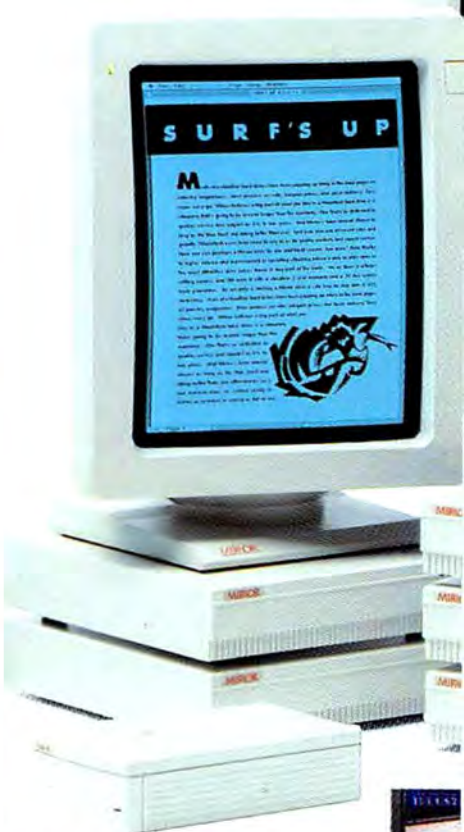
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